

SERVICE MANUAL

STEREO VIDEO CASSETTE RECORDER BASIC TAPE MECHANISM : OVD-6S

SPECIFICATIONS

POWER REQUIREMENTS	120V AC, 60Hz	TAPE SPEED	SP: 33.35 mm/sec
POWER CONSUMPTION	12W		LP: 16.67 mm/sec
	TYP 2.5W (standby mode)		SLP: 11.12 mm/sec
WEIGHT	3.2kg (7.1lbs.)	RECORDING/PLAYBACK TIME	SP: 3.5 hours with T-210 tape
DIMENSIONS	360mm (W) x 232.5mm (D) x 94mm(H)		LP: 7 hours with T-210 tape
	(14 1/4 x 13 1/8 x 3 3/4 in.)		SLP: 10.5 hours with T-210 tape
OPERATING TEMPERATURE	5°C to 40°C	VIDEO INPUT	1.0Vp-p, 75ohm, unbalanced
VIDEO RECORDING SYSTEM	Rotary 2 head helical scanning system	VIDEO OUTPUT	1.0Vp-p, 75ohm, unbalanced
VIDEO SIGNAL SYSTEM	NTSC color system, 525 lines, 60 fields	VIDEO S/N	50dB (nominal)
VIDEO HEAD	Double azimuth 4 heads	AUDIO INPUT	-8dBs, 50K ohm
USABLE CASSETTES	VHS video cassette	AUDIO OUTPUT	-8dBs, less than 1K ohm
CHANNEL COVERAGE	VHF: 2 to 13	AUDIO TRACK	3 tracks (Hi-Fi sound 2 tracks, Normal sound 1 track)
	UHF: 14 to 69	AUDIO FREQUENCY RESPONSE	Normal: 100Hz-10kHz (at SP)
	CATV: 5A, A-5 to A-1, A to W, W+1 to W-84		Hi-Fi: 20Hz-20kHz (at SP)
RF OUTPUT	VHF channel 3 or 4 (switchable), 66dBμ	AUDIO S/N	Normal: more than 42 dB (at SP)
HORIZONTAL RESOLUTION	230 lines (at SP)		
TUNER SYSTEM	Frequency synthesized tuner		
TV SYSTEM	M		
FAST-FORWARD/REWIND TIME	Approx.110 seconds with T-120 tape		
HI-FI DYNAMIC RANGE	More than 90dB (at SP)		

● Design and specifications are subject to change without notice.

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SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  mark, the designated parts must be used.

3. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

4. PERFORM A SAFETY CHECK AFTER SERVICING

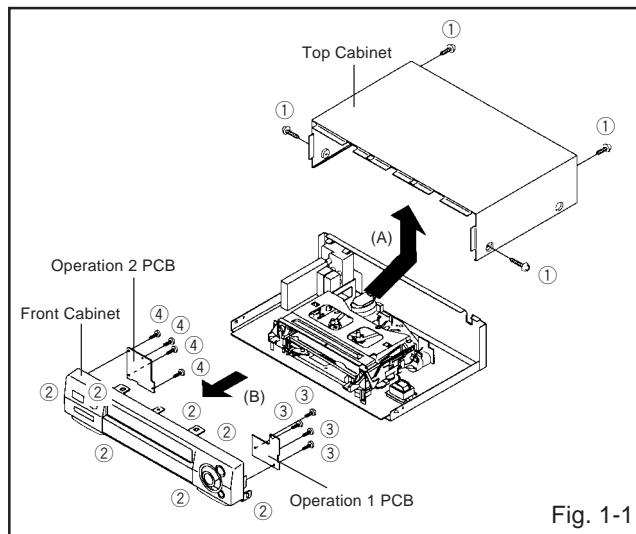
Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

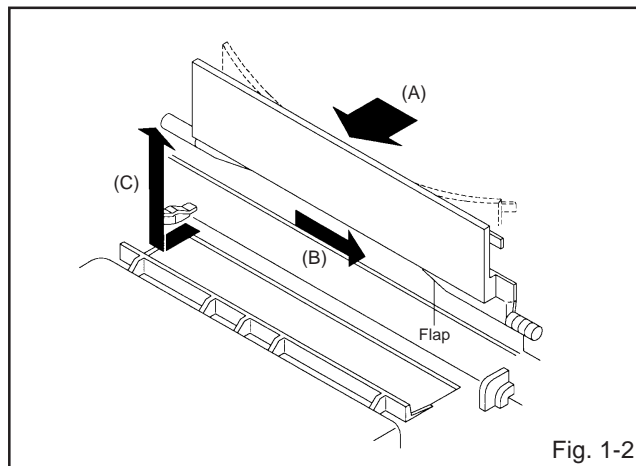
1-1: TOP CABINET, FRONT CABINET AND OPERATION PCB (Refer to Fig. 1-1)

1. Remove the 4 screws ①.
2. Remove the Top Cabinet in the direction of arrow (A).
3. Disconnect the following connectors: (CP651 and CP652).
4. Unlock the 7 supports ②.
5. Remove the Front Cabinet in the direction of arrow (B).
6. Remove the 4 screws ③ and remove the Operation 1 PCB.
7. Remove the 4 screws ③ and remove the Operation 2 PCB.



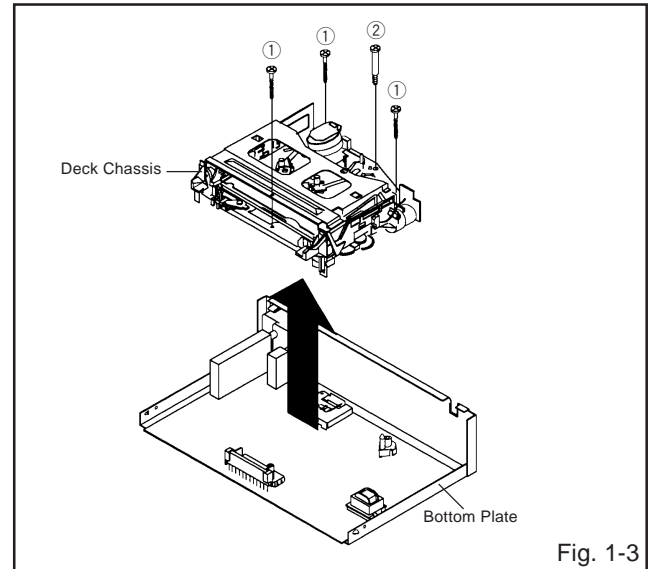
1-2: FLAP (Refer to Fig. 1-2)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).



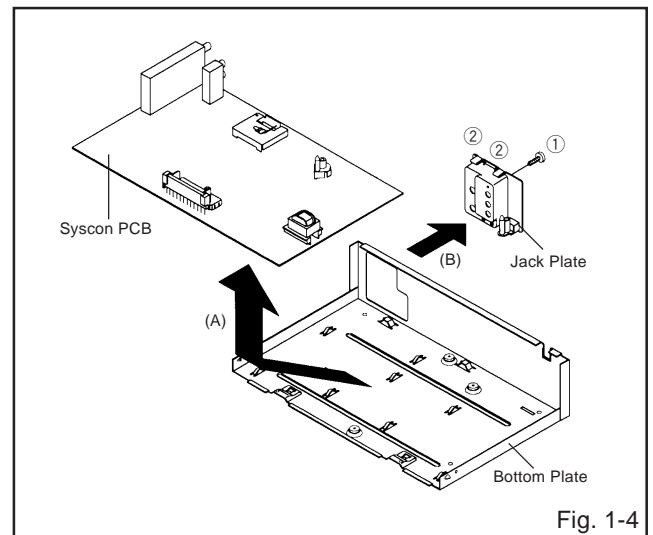
1-3: DECK CHASSIS (Refer to Fig. 1-3)

1. Remove the 3 screws ①.
2. Remove the screw ②.
3. Disconnect the following connectors: (CP1001, CP1002, CP1003, CP4001, CP4002 and CP4003).
4. Remove the Deck Chassis in the direction of arrow.



1-4: SYSCON PCB AND JACK PLATE (Refer to Fig. 1-4)

1. Remove the screw ①.
2. Remove the Syscon PCB in the direction of arrow (A).
3. Unlock the 2 supports ②.
4. Remove the Jack Plate in the direction of arrow (B).



DISASSEMBLY INSTRUCTIONS

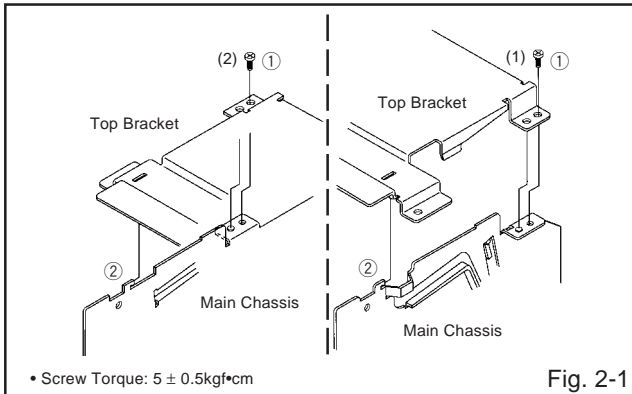
2. REMOVAL OF DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Remove the 2 screws ①.
2. Slide the 2 supports ② and remove the Top Bracket.

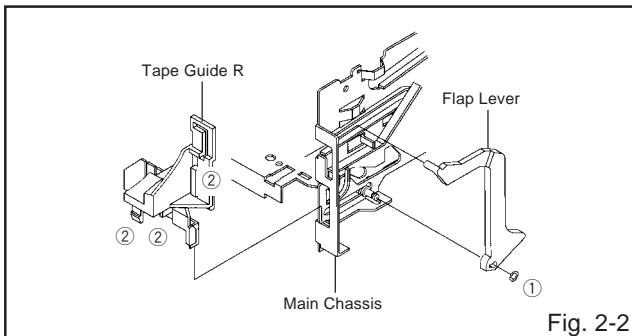
NOTE

When you install the Top Bracket, install the screw (1) first, then install the screw (2).



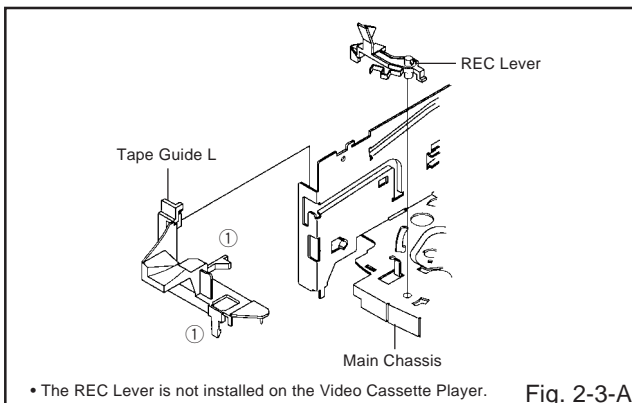
2-2: FLAP LEVER/TAPE GUIDE R (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the Polyslider Washer ①.
3. Remove the Flap Lever.
4. Unlock the 3 supports ② and remove the Tape Guide R.



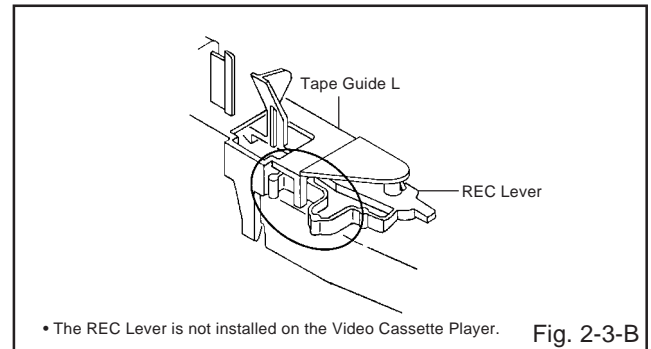
2-3: TAPE GUIDE L (Refer to Fig. 2-3-A)

1. Move the Cassette Holder Ass'y to the back side.
2. Unlock the 2 supports ① and remove the Tape Guide L.
3. Remove the REC Lever. (Recorder only)



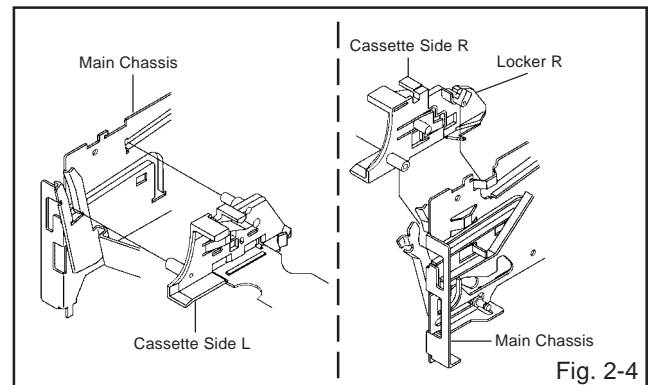
NOTE

When you install the Tape Guide L, install as shown in the circle of Fig. 2-3-B. (Refer to Fig. 2-3-B)



2-4: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-4)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

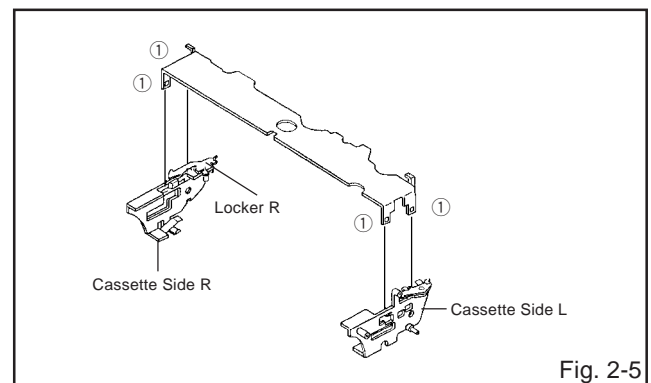


2-5: CASSETTE SIDE L/R (Refer to Fig. 2-5)

1. Unlock the 4 supports ① and then remove the Cassette Side L/R.

NOTE

When you install the Cassette Side R, be sure to move the Locker R after installing.



DISASSEMBLY INSTRUCTIONS

2-6: LINK ASS'Y (Refer to Fig. 2-6)

1. Set the Link Ass'y to the Eject position.
2. Remove the (A) side of the Link Ass'y first, then remove the (B) side.

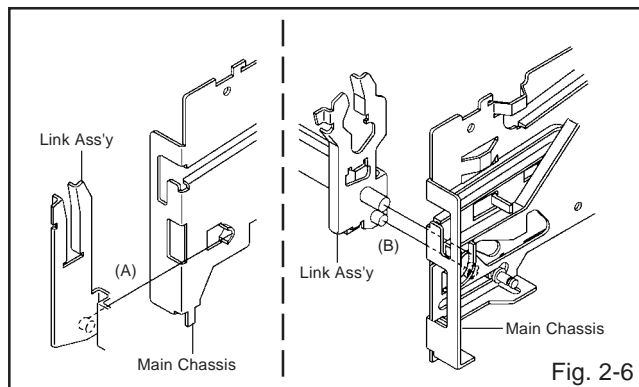


Fig. 2-6

2-7: LOADING MOTOR ASS'Y (Refer to Fig. 2-7)

1. Remove the Link Lever.
2. Remove the Dumper Spring.
3. Remove the 2 screws ①.
4. Unlock the support ② and remove the Loading Motor Ass'y.
5. Unlock the 2 supports ③ and remove the Deck PCB (BOT).

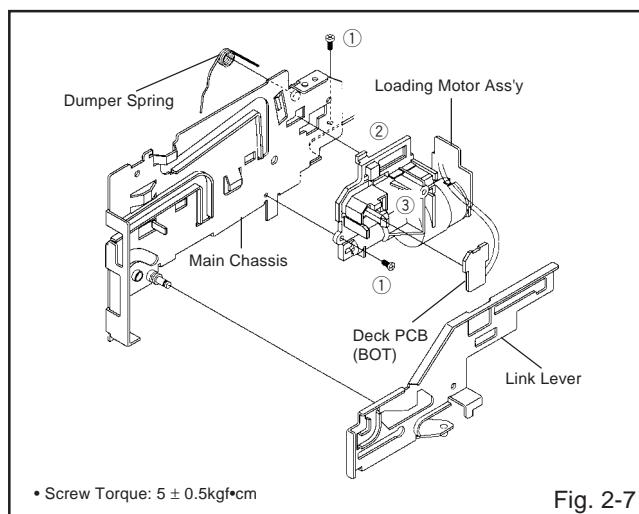


Fig. 2-7

2-8: SENSOR COVER L3 (Refer to Fig. 2-8)

1. Unlock the support ① and remove the Sensor Cover L3.

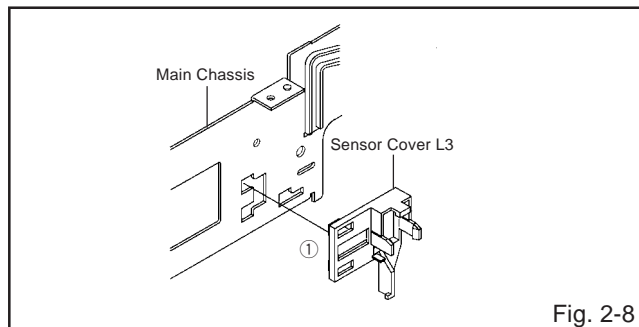


Fig. 2-8

2-9: TENSION ASS'Y (Refer to Fig. 2-9-A)

1. Move the Inclined S Ass'y to the back side.
2. Remove the Tension Spring.
3. Unlock the support ① and remove the Tension Arm Ass'y.
4. Remove the Tension Adjust.
5. Unlock the 2 supports ② and remove the Tension Band Ass'y.
6. Unlock the support ③ and remove the Tension Holder.
7. Remove the SS Brake Spring.
8. Remove the SS Arm Brake.

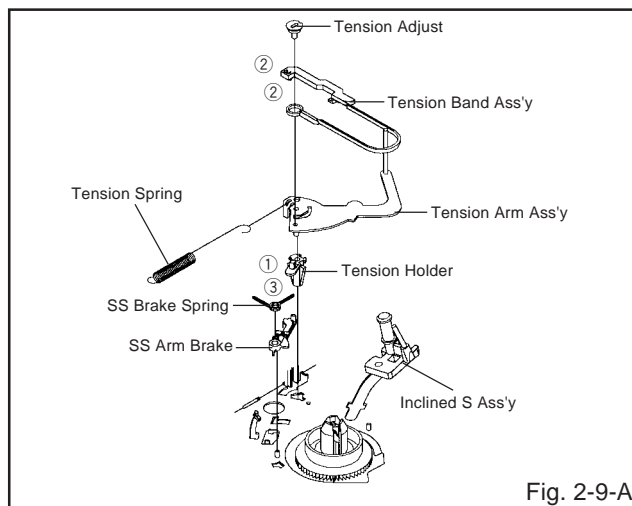


Fig. 2-9-A

NOTE

When you install the Tension Adjust, install as shown in Fig. 2-9-B. (Refer to Fig. 2-9-B)

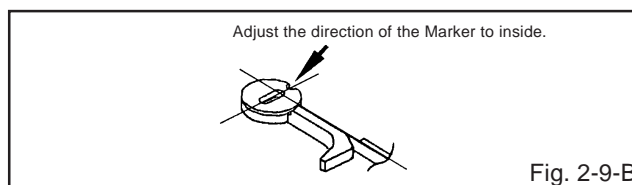


Fig. 2-9-B

2-10: T BRAKE ASS'Y (Refer to Fig. 2-10)

1. Remove the T Brake Spring.
2. Remove the T Brake Ass'y.

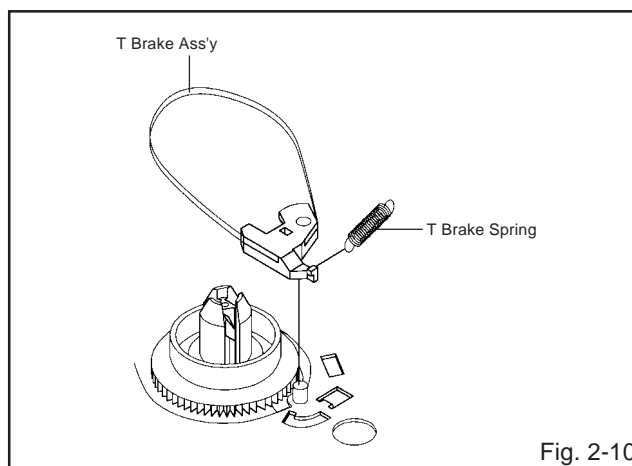


Fig. 2-10

DISASSEMBLY INSTRUCTIONS

2-11: S REEL/T REEL (Refer to Fig. 2-11)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-11)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and oil it (FL OIL #6115). (If you do not oil, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

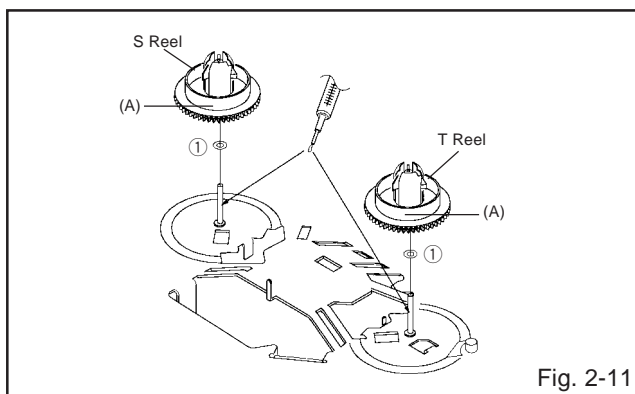
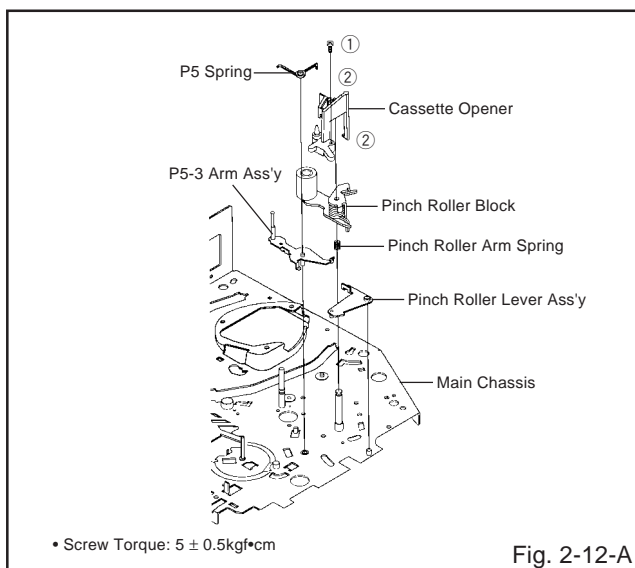


Fig. 2-11

2-12: PINCH ROLLER BLOCK/P5-3 ARM ASS'Y (Refer to Fig. 2-12-A)

1. Remove the P5 Spring.
2. Remove the screw ①.
3. Unlock the 2 supports ② and remove the Cassette Opener.
4. Remove the Pinch Roller Block, Pinch Roller Arm Spring, Pinch Roller Lever Ass'y and P5-3 Arm Ass'y.



• Screw Torque: $5 \pm 0.5 \text{ kgf} \cdot \text{cm}$

Fig. 2-12-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. When you install the Pinch Roller Block, install as shown in the circle of Fig. 2-12-B. **(Refer to Fig. 2-12-B)**

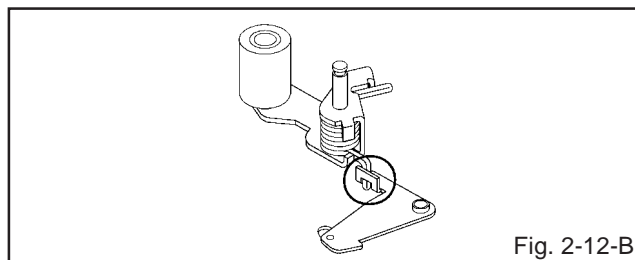


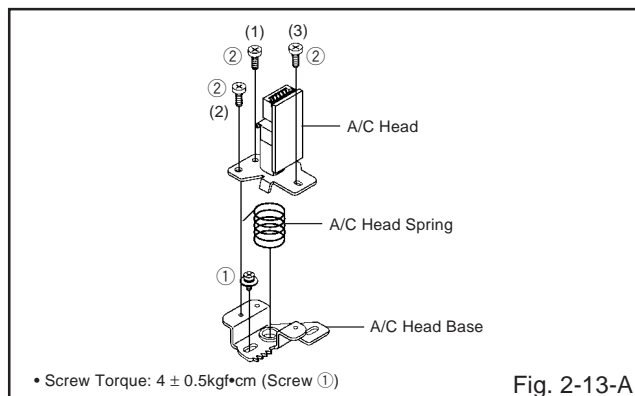
Fig. 2-12-B

2-13: A/C HEAD (Refer to Fig. 2-13-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-13-B. **(Refer to Fig. 2-13-B)**
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque: $4 \pm 0.5 \text{ kgf} \cdot \text{cm}$ (Screw ①)

Fig. 2-13-A

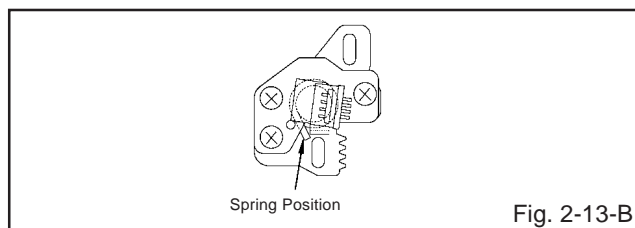
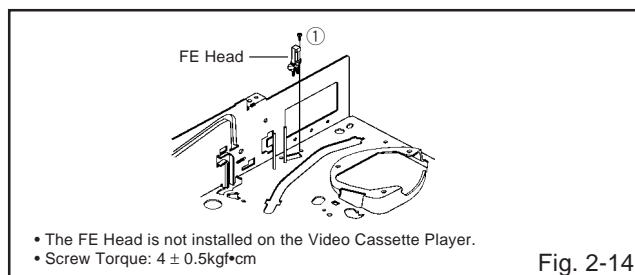


Fig. 2-13-B

2-14: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-14)

1. Remove the screw ①.
2. Remove the FE Head.



• The FE Head is not installed on the Video Cassette Player.
• Screw Torque: $4 \pm 0.5 \text{ kgf} \cdot \text{cm}$

Fig. 2-14

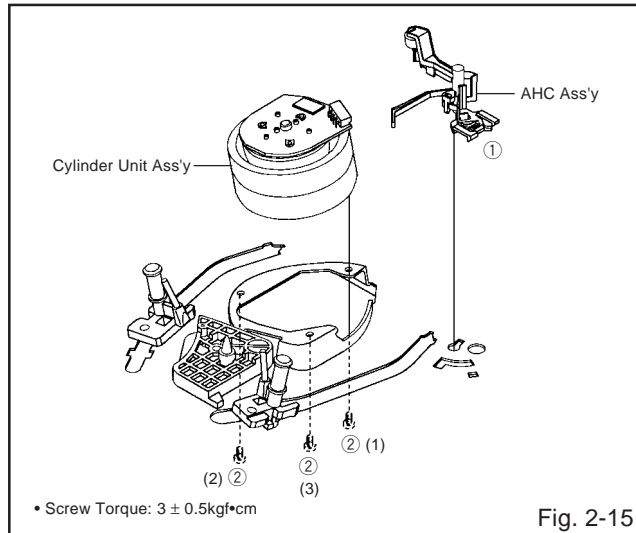
DISASSEMBLY INSTRUCTIONS

2-15: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-15)

1. Unlock the support ① and remove the AHC Ass'y.
2. Remove the 3 screws ②.
3. Remove the Cylinder Unit Ass'y.

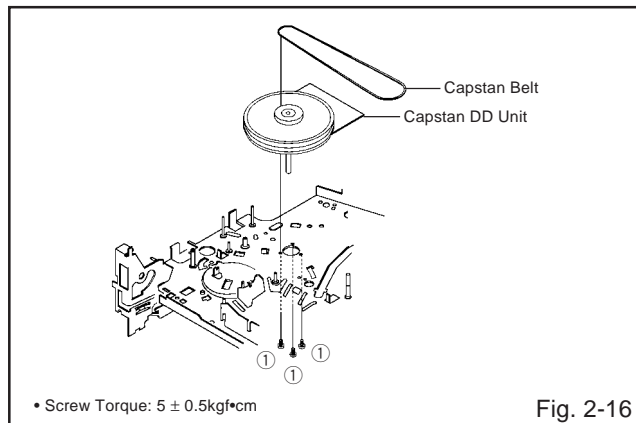
NOTE

When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



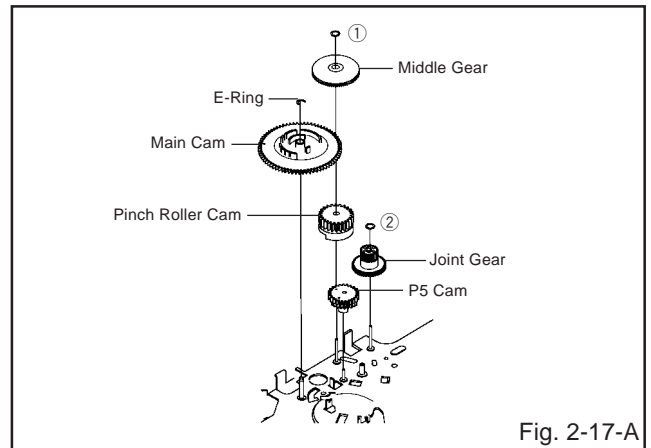
2-16: CAPSTAN DD UNIT (Refer to Fig. 2-16)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.



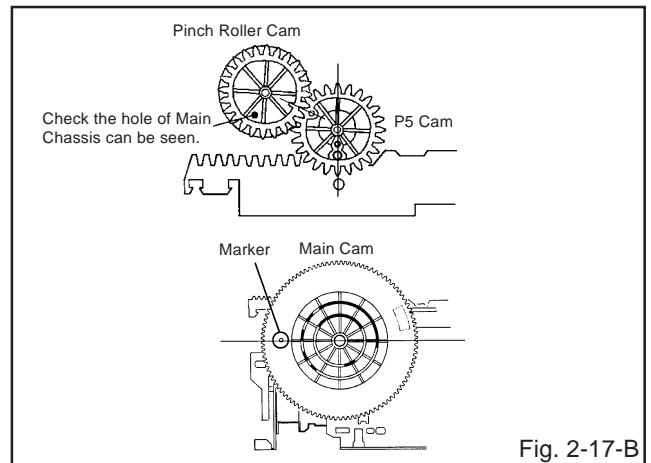
2-17: MIDDLE GEAR/MAIN CAM (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①, then remove the Middle Gear.
2. Remove the E-Ring, then remove the Main Cam, P5 Cam and Pinch Roller Cam.
3. Remove the Polyslider Washer ②, then remove the Joint Gear.



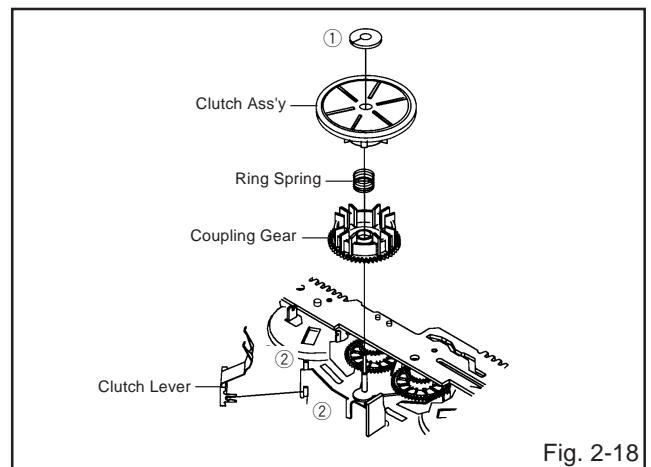
NOTE

When you install the Pinch Roller Cam, P5 Cam and Main Cam, align each marker. (Refer to Fig. 2-17-B)



2-18: CLUTCH ASS'Y (Refer to Fig. 2-18)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y, Ring Spring and Coupling Gear.
3. Unlock the 2 supports ② and remove the Clutch Lever.



DISASSEMBLY INSTRUCTIONS

2-19: LOADING GEAR S/T ASS'Y (Refer to Fig. 2-19-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Capstan Brake Spring.
3. Slide the Main Rod and remove the Capstan Brake Ass'y.
4. Remove the Main Rod, Tension Lever, Clutch Actuator, Idler Arm Ass'y.
5. Remove the screw ②.
6. Remove the LED Reflector.
7. Remove the Loading Arm S Ass'y and Loading Arm T Ass'y.
8. Remove the Loading Gear S and Loading Gear T.
9. Remove the Loading Gear Spring.

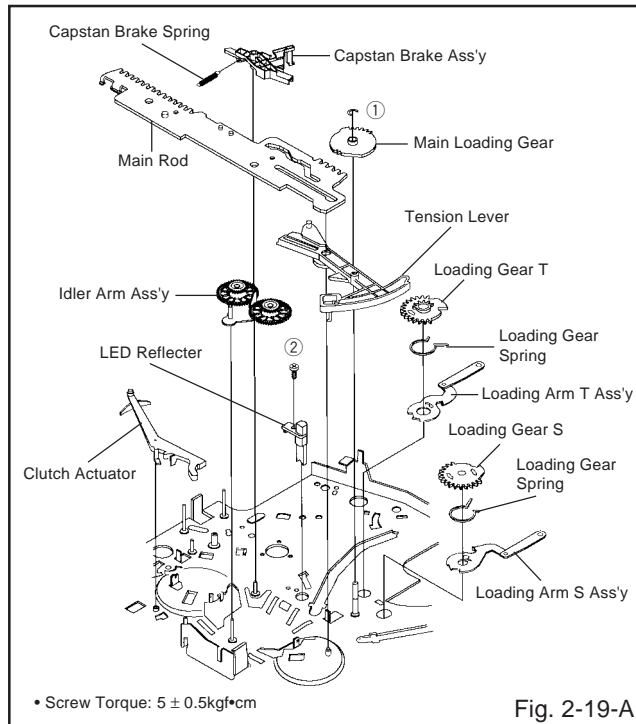


Fig. 2-19-A

NOTES

1. When you install the Loading Arm S Ass'y, Loading Arm T Ass'y and Main Loading Gear, align each marker. (Refer to Fig. 2-19-B)

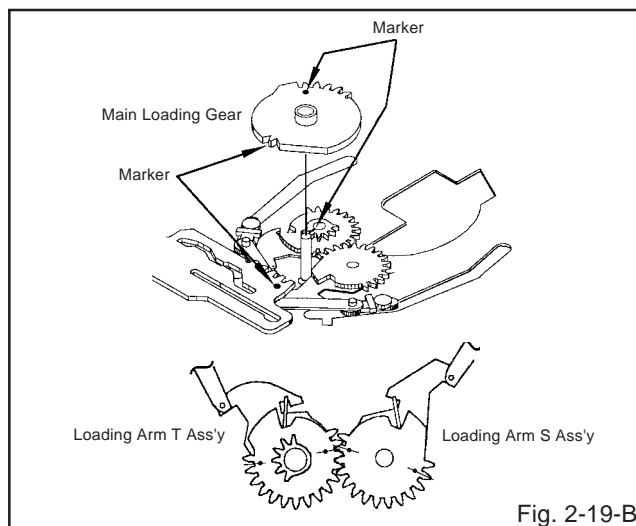


Fig. 2-19-B

2. When you install the Clutch Actuator, install as shown in the circle of Fig. 2-19-C. (Refer to Fig. 2-19-C)

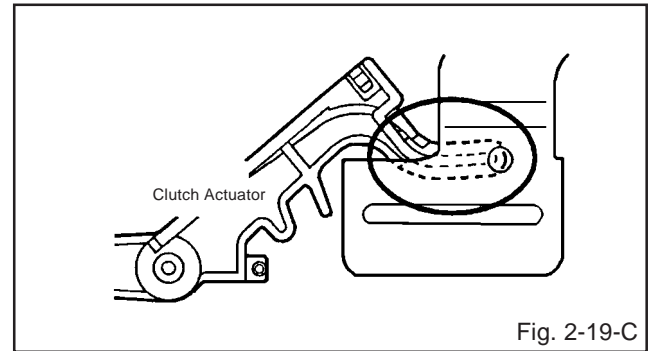


Fig. 2-19-C

2-20: INCLINED S/T ASS'Y (Refer to Fig. 2-20)

1. Unlock the support ① and remove the P4 Cover.
2. Remove the screw ②.
3. Unlock the support ③ and remove the Loading Gear Holder.
4. Remove the Inclined S.
5. Remove the Inclined T.
6. Remove the 2 screws ④, then remove the Guide Roller.

NOTE

Do not touch the roller of Guide Roller.

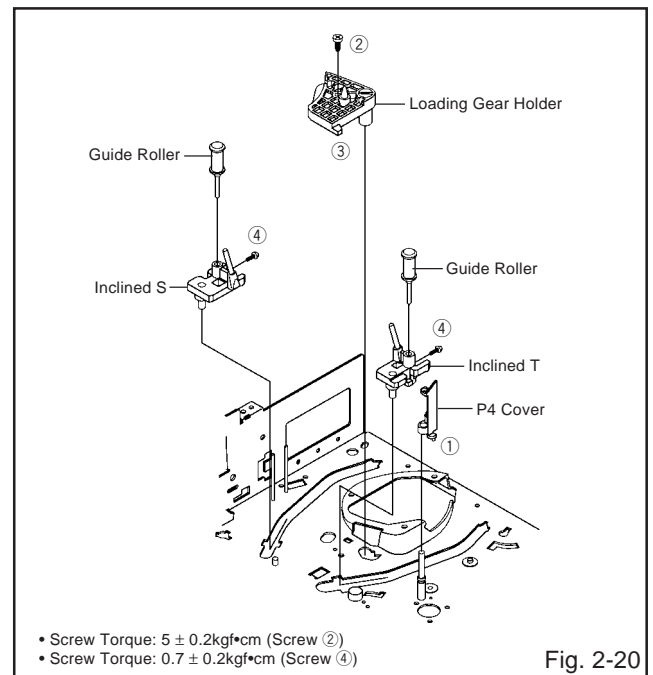


Fig. 2-20

KEY TO ABBREVIATIONS

A	A/C	: Audio/Control	H.SW	: Head Switch	
	ACC	: Automatic Color Control	Hz	: Hertz	
	AE	: Audio Erase	I	IC	: Integrated Circuit
	AFC	: Automatic Frequency Control		IF	: Intermediate Frequency
	AFT	: Automatic Fine Tuning		IND	: Indicator
	AFT DET	: Automatic Fine Tuning Detect		INV	: Inverter
	AGC	: Automatic Gain Control	K	KIL	: Killer
	AMP	: Amplifier	L	L	: Left
	ANT	: Antenna		LED	: Light Emitting Diode
	A.PB	: Audio Playback		LIMIT AMP	: Limiter Amplifier
	APC	: Automatic Phase Control		LM, LDM	: Loading Motor
	ASS'Y	: Assembly		LP	: Long Play
	AT	: All Time		L.P.F	: Low Pass Filter
	AUTO	: Automatic		LUMI.	: Luminance
	A/V	: Audio/Video	M	M	: Motor
B	BGP	: Burst Gate Pulse		MAX	: Maximum
	BOT	: Beginning of Tape		MINI	: Minimum
	BPF	: Bandpass Filter		MIX	: Mixer, mixing
	BRAKE SOL	: Brake Solenoid		MM	: Monostable Multivibrator
	BUFF	: Buffer		MOD	: Modulator, Modulation
	B/W	: Black and White		MPX	: Multiplexer, Multiplex
C	C	: Capacitance, Collector		MS SW	: Mecha State Switch
	CASE	: Cassette	N	NC	: Non Connection
	CAP	: Capstan		NR	: Noise Reduction
	CARR	: Carrier	O	OSC	: Oscillator
	CH	: Channel		OPE	: Operation
	CLK	: Clock	P	PB	: Playback
	CLOCK (SY-SE)	: Clock (Syscon to Servo)		PB CTL	: Playback Control
	COMB	: Combination, Comb Filter		PB-C	: Playback-Chrominance
	CONV	: Converter		PB-Y	: Playback-Luminance
	CPM	: Capstan Motor		PCB	: Printed Circuit Board
	CTL	: Control		P. CON	: Power Control
	CYL	: Cylinder		PD	: Phase Detector
	CYL-M	: Cylinder-Motor		PG	: Pulse Generator
	CYL SENS	: Cylinder-Sensor		P-P	: Peak-to Peak
D	DATA (SY-CE)	: Data (Syscon to Servo)	R	R	: Right
	dB	: Decibel		REC	: Recording
	DC	: Direct Current		REC-C	: Recording-Chrominance
	DD Unit	: Direct Drive Motor Unit		REC-Y	: Recording-Luminance
	DEMODO	: Demodulator		REEL BRK	: Reel Brake
	DET	: Detector		REEL S	: Reel Sensor
	DEV	: Deviation		REF	: Reference
E	E	: Emitter		REG	: Regulated, Regulator
	EF	: Emitter Follower		REW	: Rewind
	EMPH	: Emphasis		REV, RVS	: Reverse
	ENC	: Encoder		RF	: Radio Frequency
	ENV	: Envelope		RMC	: Remote Control
	EOT	: End of Tape		RY	: Relay
	EQ	: Equalizer	S	S. CLK	: Serial Clock
	EXT	: External		S. COM	: Sensor Common
F	F	: Fuse		S. DATA	: Serial Data
	FBC	: Feed Back Clamp		SEG	: Segment
	FE	: Full Erase		SEL	: Select, Selector
	FF	: Fast Forward, Flipflop		SENS	: Sensor
	FG	: Frequency Generator		SER	: Search Mode
	FL SW	: Front Loading Switch		SI	: Serial Input
	FM	: Frequency Modulation		SIF	: Sound Intermediate Frequency
	FSC	: Frequency Sub Carrier		SO	: Serial Output
	FWD	: Forward		SOL	: Solenoid
G	GEN	: Generator		SP	: Standard Play
	GND	: Ground		STB	: Serial Strobe
H	H.P.F	: High Pass Filter		SW	: Switch

KEY TO ABBREVIATIONS

S	SYNC	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	TR	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	UNREG	:	Unregulated
V	V	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	X'TAL	:	Crystal
Y	Y/C	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

Method	Operations
Press both PLAY button and CH UP button on the set for more than 2 seconds.	Initialization of the factory. NOTE: Do not use this for the normal servicing.
While pressing the CH UP key on the set, press the FF key on the set for more than 2 seconds.	PLAY/REC total hours are displayed on the FIP. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF USING HOURS). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "NOTE FOR THE REPLACING OF MEMORY IC".
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
While pressing the CH UP button on the set, press the STOP button on the set for more than 2 seconds during PLAY.	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The EOT/BOT/Reel sensor do not work at this moment. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

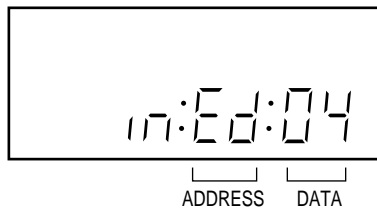
Time Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	■	■	
Capstan Belt			■	■	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■	■	■	●	Clean the Head

■ : Clean
● : Replace

CONFIRMATION OF USING HOURS

PLAY/REC total hours can be checked on the FIP.
Total hours are displayed in 16 system of notation.

1. Turn on the POWER.
2. While pressing the CH UP button on the set, press the FF button on the set for more than 2 seconds.
3. Adjust the ADDRESS to "20" by SET +/- button and read the DATA.
(This DATA becomes the thousands digit and hundreds digit value of the following formula.)
4. Adjust the ADDRESS to "21" by SET +/- button and read the DATA.
(This DATA becomes the tens digit and ones digit value of the following formula.)
5. After the confirmation of using hours, turn off the power.



$(16 \times 16 \times 16 \times \text{thousands digit value}) + (16 \times 16 \times \text{hundreds digit value}) + (16 \times \text{tens digit value}) + (\text{ones digit value})$

PREVENTIVE CHECKS AND SERVICE INTERVALS

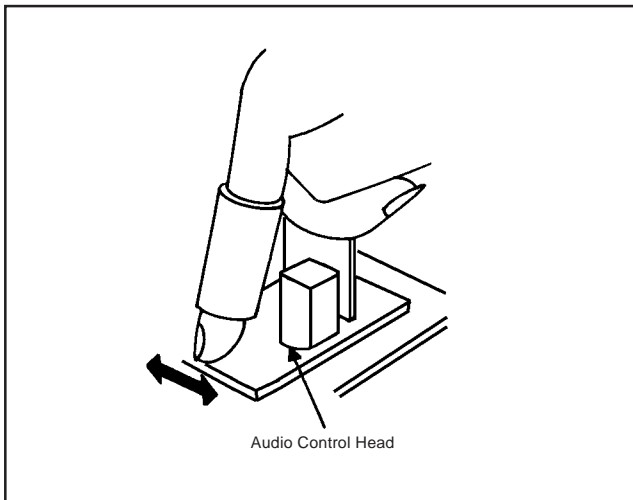
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

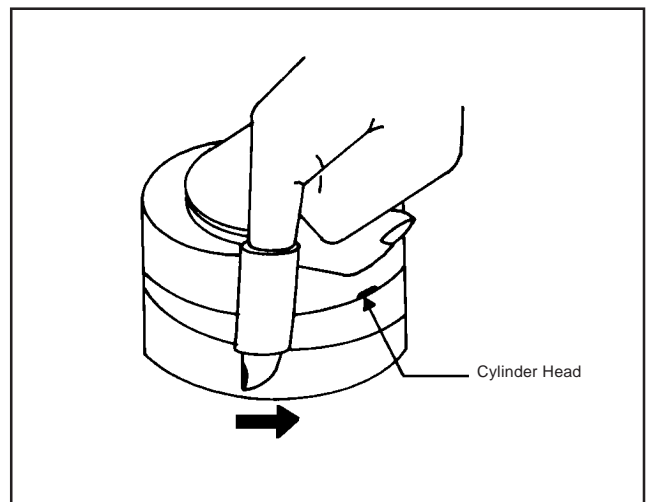
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



NOTE FOR THE REPLACING OF MEMORY IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	0A	54	43	00	64	64	4A	06	0B	37	86	33	08	08	0C	0C
10	8C	68	5C	53	20	45	31	04	88	A5	9F	3A	00	10	BF	00

Table 1

1. Turn on the POWER.
2. While pressing the CH UP key on the set, press the FF key on the set for more than 2 seconds.
ADDRESS and DATA should appear as FIG 1.

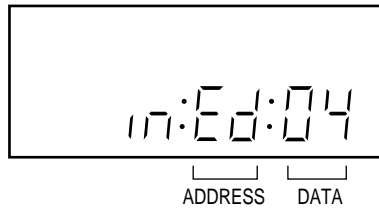
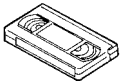
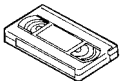
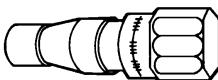
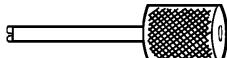
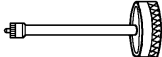
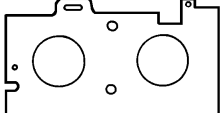
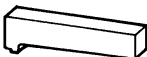
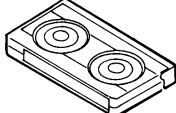
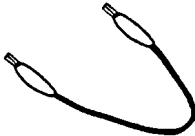
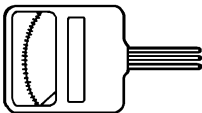


Fig. 1

3. ADDRESS is now selected and should "blink". Using the SET + or - keys on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET + or - until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.
The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

(For 2 heads model) VHS Alignment Tape JG001 (TTV-N2) JG001A (TTV-N12) JG001T (VN ₂ S-X6 ³) 	(For 4 heads model) VHS Alignment Tape JG001B (TTV-N2) JG001I (TTV-N12) JG001S (VN ₁ S-X6 ³) 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 <small>(small)</small> 
JG153 X Value Adjustment Screwdriver 	JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 
JG154 Cable Parts No. SJ-G15-400-000 	Tentelometer 		

Part No.	Remarks
JG001	Stair Steps, 7KHz (For 2 heads model)
JG001A	Color Bar, 1KHz (For 2 heads model)
JG001T	X Value Adjustment (For 2 heads model)
JG001B	Stair Steps, 7KHz (For 4 heads model)
JG001I	Color Bar, 1KHz (For 4 heads model)
JG001S	X Value Adjustment (For 4 heads model)
JG002B	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	Brake Torque (T Reel Ass'y)
JG002F	VSR Torque, Brake Torque (S Reel)
JG005	Guide Roller Adjustment
JG153	X Value Adjustment
JG022/JG024A	Reel Disk Height Adjustment
JG100A	Playback Torque, Back Tension Torque During Playback
JG154	Used to connect the test point of SERVICE and GROUND

PREPARATION FOR SERVICING

- Short circuit between **TP1001** and **Ground** with the cable JG154.
(Refer to MAJOR COMPONENTS LOCATION GUIDE)
The EOT, BOT and Reel Sensor do not work at this moment.
At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

VCR TEST TAPE INTERCHANGEABILITY TABLE

There are two types of the new alignment tape CH-1B (for NTSC) and CH-2 (for PAL). On each tape four signals (1) - (4) are recorded for the times and in the order shown below.

(1) : 8min. ---> (2) : 2min. ---> (3) : 5min. ---> (4) : 5min.

The TTV-MP1 (for M-PAL), TTV-MS1 (for MESECAM) and TTV-S1 (for SECAM) alignment tapes have the same contents as the previous tapes.

Method	Now in use TYPE		New TYPE		Application
	Model	Contents*1	Model	Contents*1	
NTSC	TTV-N1	NTSC, Color, 1kHz, SP	CH-1B(2)	NTSC, Stairsteps, 1kHz, SP	PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-N1E	NTSC, Color, 1kHz, EP	CH-1B(4) *2	NTSC, Color, 1kHz, EP	Switching position ADJ.
	TTV-N2	NTSC, Stairsteps, 7kHz, SP	CH-1B(1)	NTSC, Stairsteps, 7kHz, SP	Head ACE Azimuth ADJ.
	TTV-N12 (SCV-1998)	NTSC, Color, 1kHz, SP	CH-1B(4)	NTSC, Color, 1kHz, EP	FM envelope ADJ. X-Value ADJ.
	TTV-N7A	NTSC, Stairsteps, 1kHz, SP, HiFi 400Hz	CH-1B(3)	NTSC, Color, No sound SP, HiFi 400Hz	HiFi Audio PB Level ADJ.
PAL	TTV-P1	PAL, Color, 1kHz, SP	CH-2(2) *3	PAL, Stairsteps, 1kHz, SP	Switching position ADJ. PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-P1L	PAL, Color, 1kHz, LP	CH-2(4)	PAL, Color, 1kHz, LP	Switching position. (LP Model) FM Envelope ADJ. (LP Model) X-Value ADJ. (LP Model)
	TTV-P2	PAL, Stairsteps, 6kHz, SP	CH-2(1)	PAL, Stairsteps, 6kHz, SP	Head ACE Azimuth ADJ. FM Envelope ADJ. (SP Model) X-Value ADJ. (SP Model)
	TTV-P7	PAL, Stairsteps, 1kHz, SP, HiFi, 1kHz	CH-2(3)	PAL, Color, No sound SP, HiFi 400Hz	HiFi Audio PB Level ADJ.
	TTV-P16	PAL, Color, 400Hz, SP, HiFi 1kHz	No Changed.		FM Filter ADJ.

*1. Described in the order of color format. Video signal. Linear audio. Tape speed and Hi-Fi audio.

*2. Use CH-1B (1) - (3) with models used exclusively in the SP mode.

*3. Use CH-2 (3) and (4) when it is necessary to observe the chroma signal.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)
- When you activate the deck without the Cassette Holder, short circuit between **TP1001** and **GND**. (Refer to **ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE**) In this condition the BOT/EOT/Reel Sensor will not function.

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. Confirm that "A" of the reel disk is lower than "B" of the reel disk height adjustment jig (**JG024A**), and is higher than "C". If it is not enough height, adjust to $10(+0.2, -0)$ mm with the height adjustment washer.
4. Adjust the other reel in the same way.

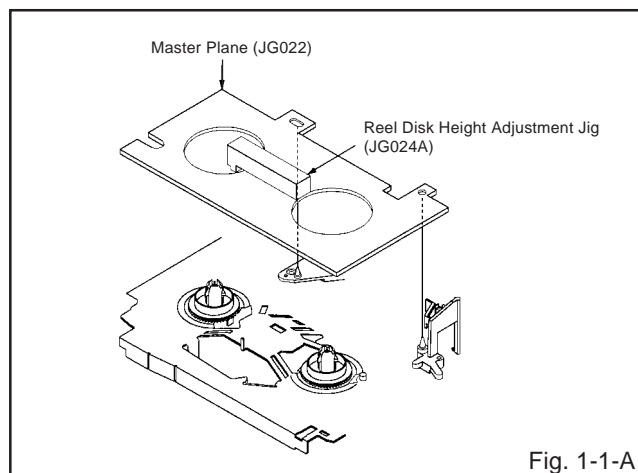


Fig. 1-1-A

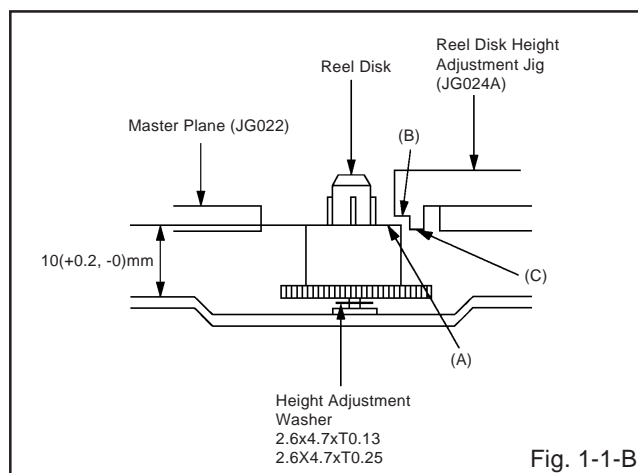


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the Tension Adjust until the edge of the Tension Arm is positioning within 0.5mm range from the standard line center of Main Chassis. After this adjustment, confirm that the cut position is located in "A" area as shown in **Fig. 1-2-B**. If it is located in "B" area, adjust again.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

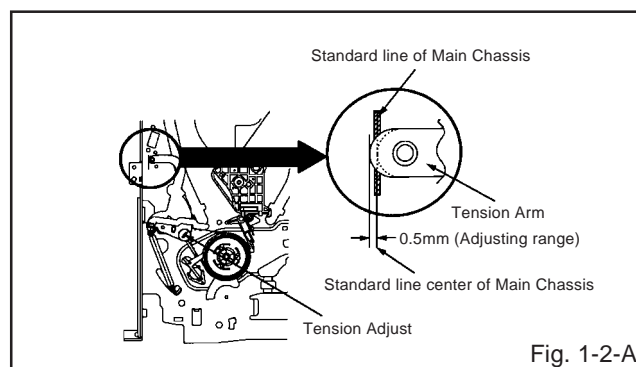


Fig. 1-2-A

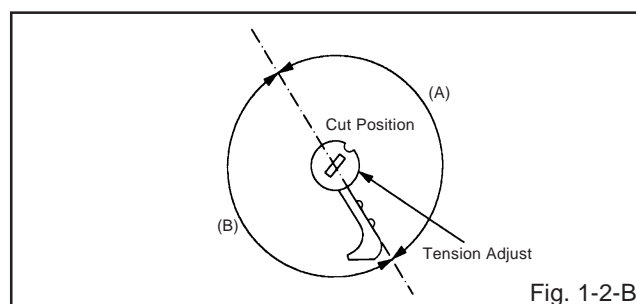


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2 gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE (**JG100A**)

1. After confirmation and adjustment of Tension Post position (Refer to item 1-2), load the cassette type torque tape (**JG100A**) and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates $60 \sim 110$ gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates $25 \sim 40$ gf•cm during playback in SP mode.

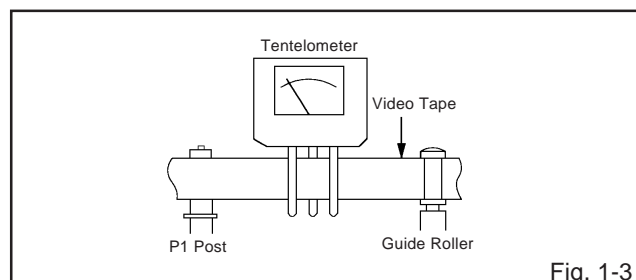


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Operate within 4~5 seconds after the reel disk begins to turn.
2. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Set to the Rewind mode. (Refer to Fig.1-4)
3. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

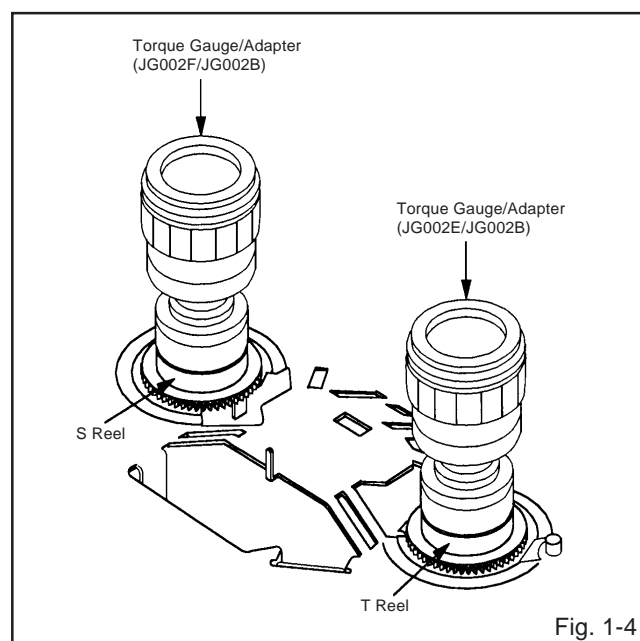
1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4)

1. Set to the STOP mode.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Turn the Torque Gauge (**JG002F**) clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4)

1. Set to the STOP mode.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge (**JG002E**) and Adapter (**JG002B**) on the T reel. Turn the Torque Gauge (**JG002E**) counterclockwise.
4. Then, confirm that it indicates 45~70gf•cm.



NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	T Brake Spring/Tension Spring

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

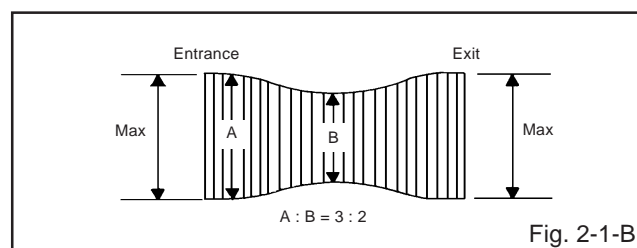
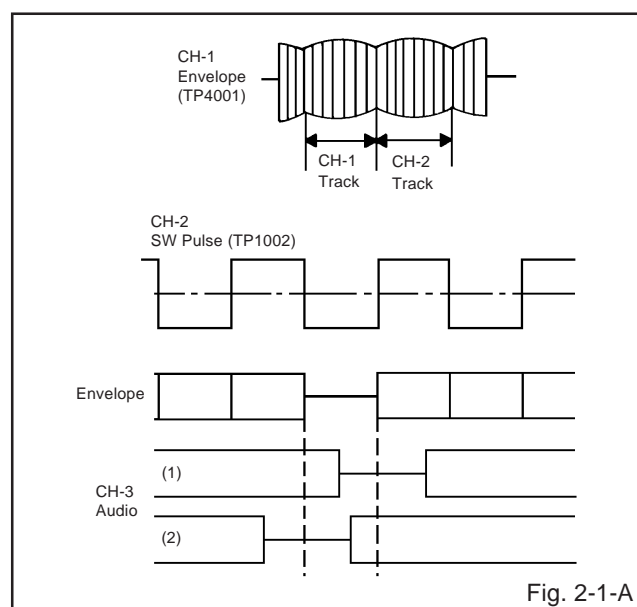
Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape (**JG001** or **JG001B**). (Refer to **SERVICING FIXTURE AND TOOLS**)
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Adjusting Driver (**JG005**) slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. (Refer to the **ELECTRICAL ADJUSTMENTS**)

NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)

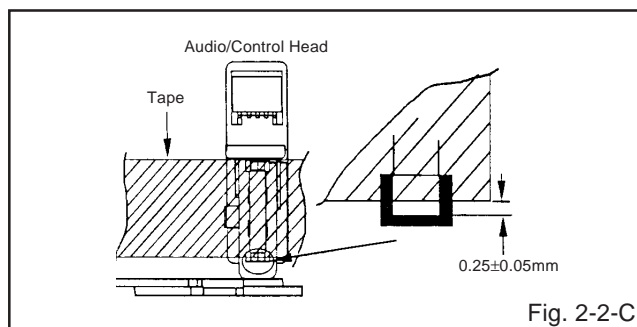
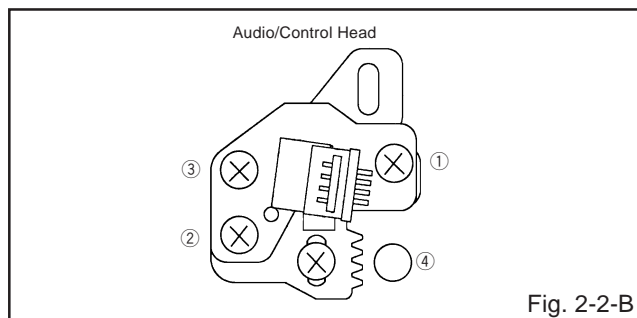
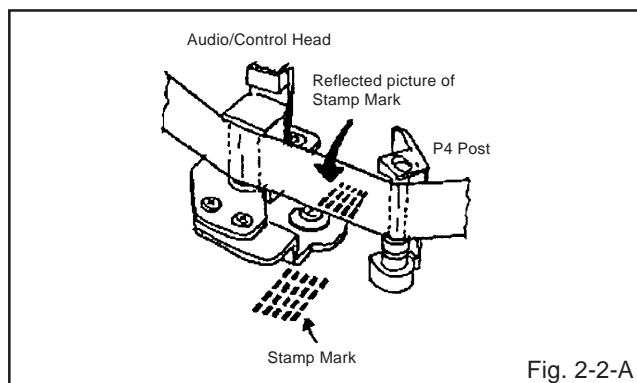


MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape (**JG001 or JG001B**).
(Refer to **SERVICING FIXTURE AND TOOLS**)
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A**.
 - a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
 - b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
 - c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

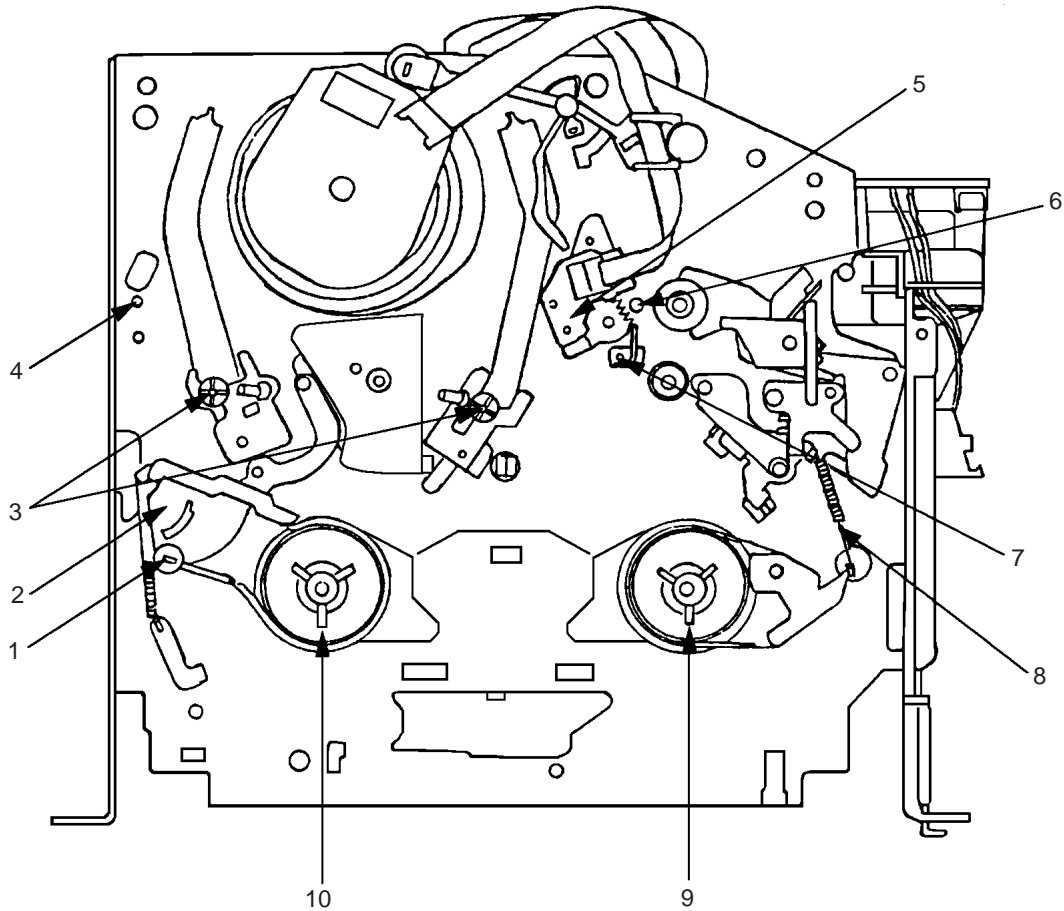


2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk.
(Refer to item 1-1)
2. Confirm and adjust the position of the Tension Post.
(Refer to item 1-2)
3. Adjust the Guide Roller. (Refer to item 2-1)
4. Confirm and adjust the Audio/Control Head.
(Refer to item 2-2)
5. Connect CH-1 of the oscilloscope to **TP4001**, CH-2 to **TP1002** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape (**JG001S or JG001T**).
(Refer to **SERVICING FIXTURE AND TOOLS**)
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (**JG153**) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-1-A**.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- 1. Tension Adjust
- 2. Tension Arm
- 3. Guide Roller
- 4. P1 Post
- 5. Audio/Control Head

- 6. X value adjustment driver hole
- 7. P4 Post
- 8. T Brake Spring
- 9. T Reel
- 10. S Reel

ELECTRICAL ADJUSTMENTS

Read and perform this adjustment when repairing the circuits or replacing electrical parts or PCB assemblies.

1. BASIC ADJUSTMENT

CAUTION

When replacing IC's or transistors, use only specified silicon grease (**G746**).
(To prevent the damage to IC's and transistors.)

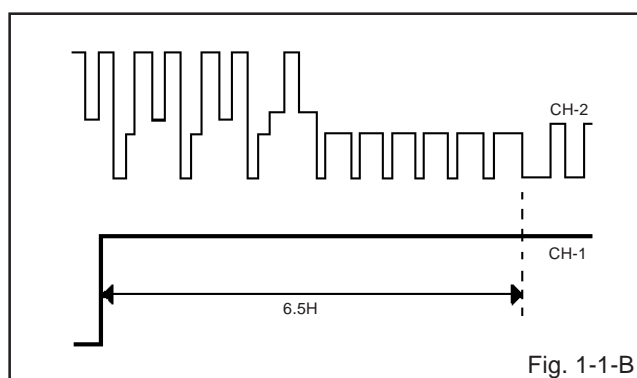
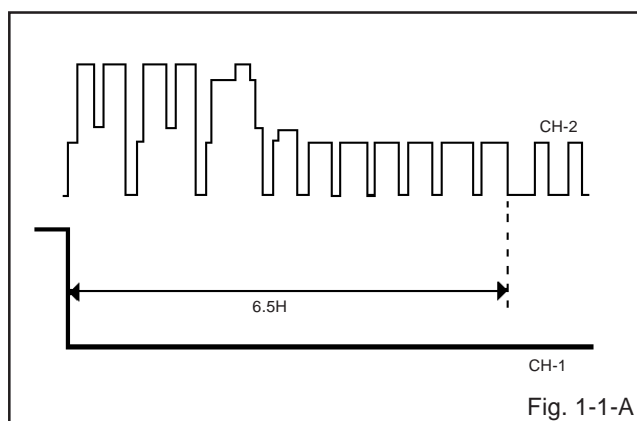
1-1: PG SHIFTER

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape (**JG001B**)

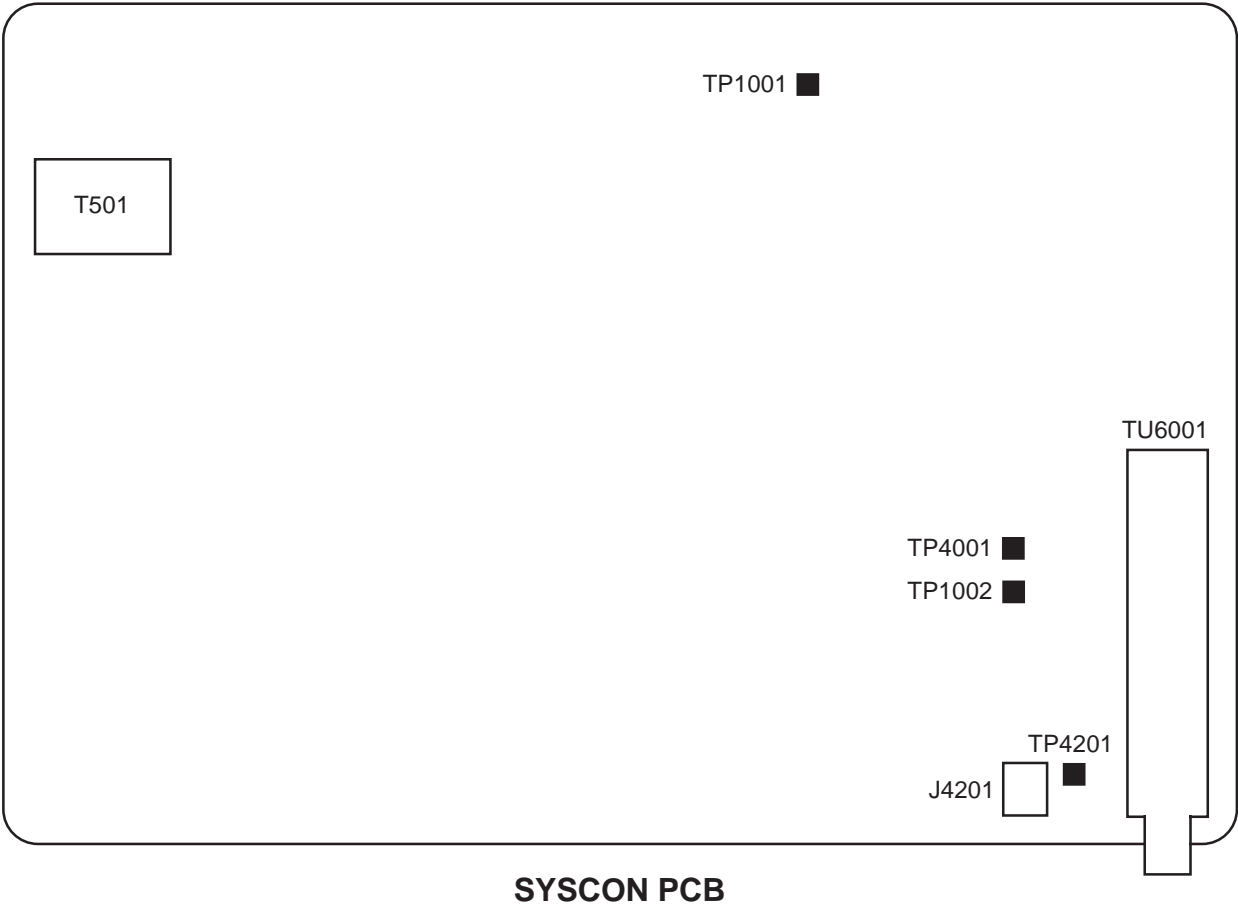
INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **TP4201**.
2. Playback the alignment tape. (**JG001B**)
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. While pressing the CH UP button on the set, press the STOP button on the set for more than 2 seconds. If the indicator ATR disappear's, the adjustment is finished.
(Refer to Fig. 1-1-A, B)

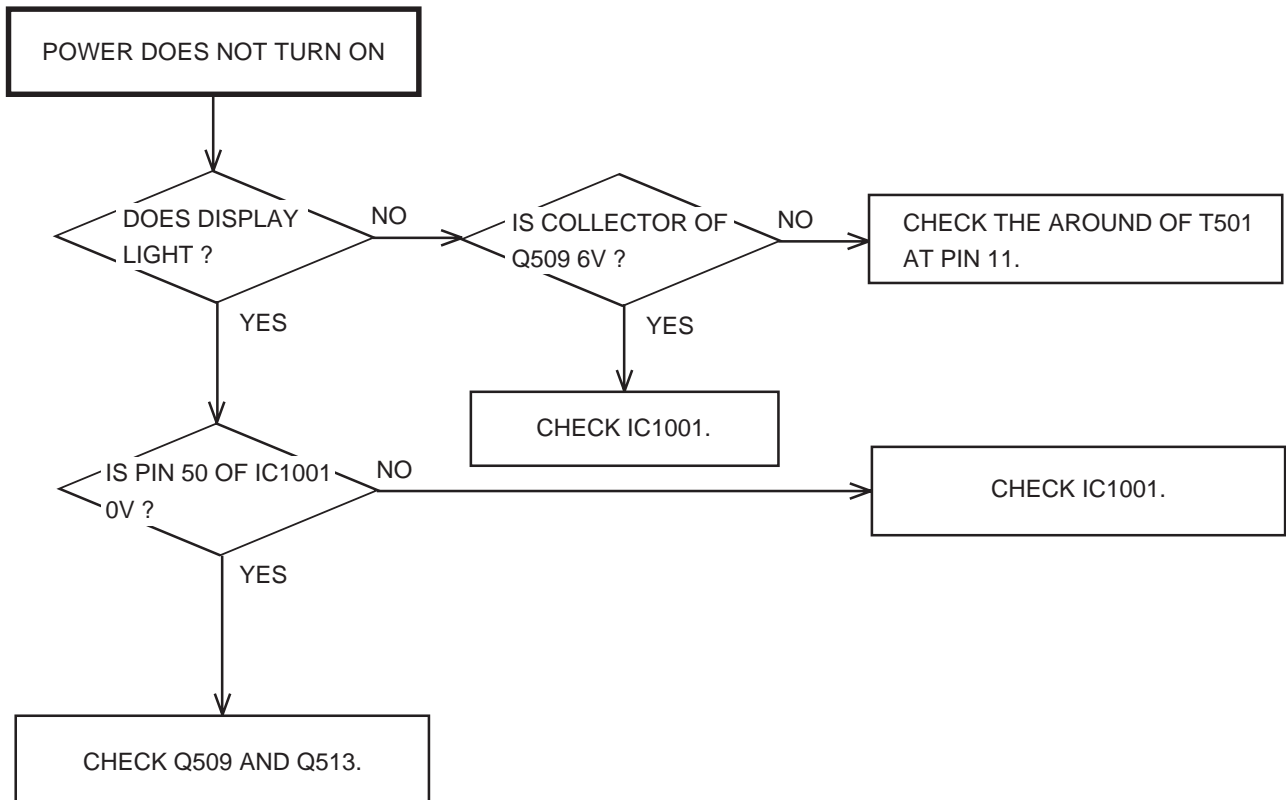


ELECTRICAL ADJUSTMENTS

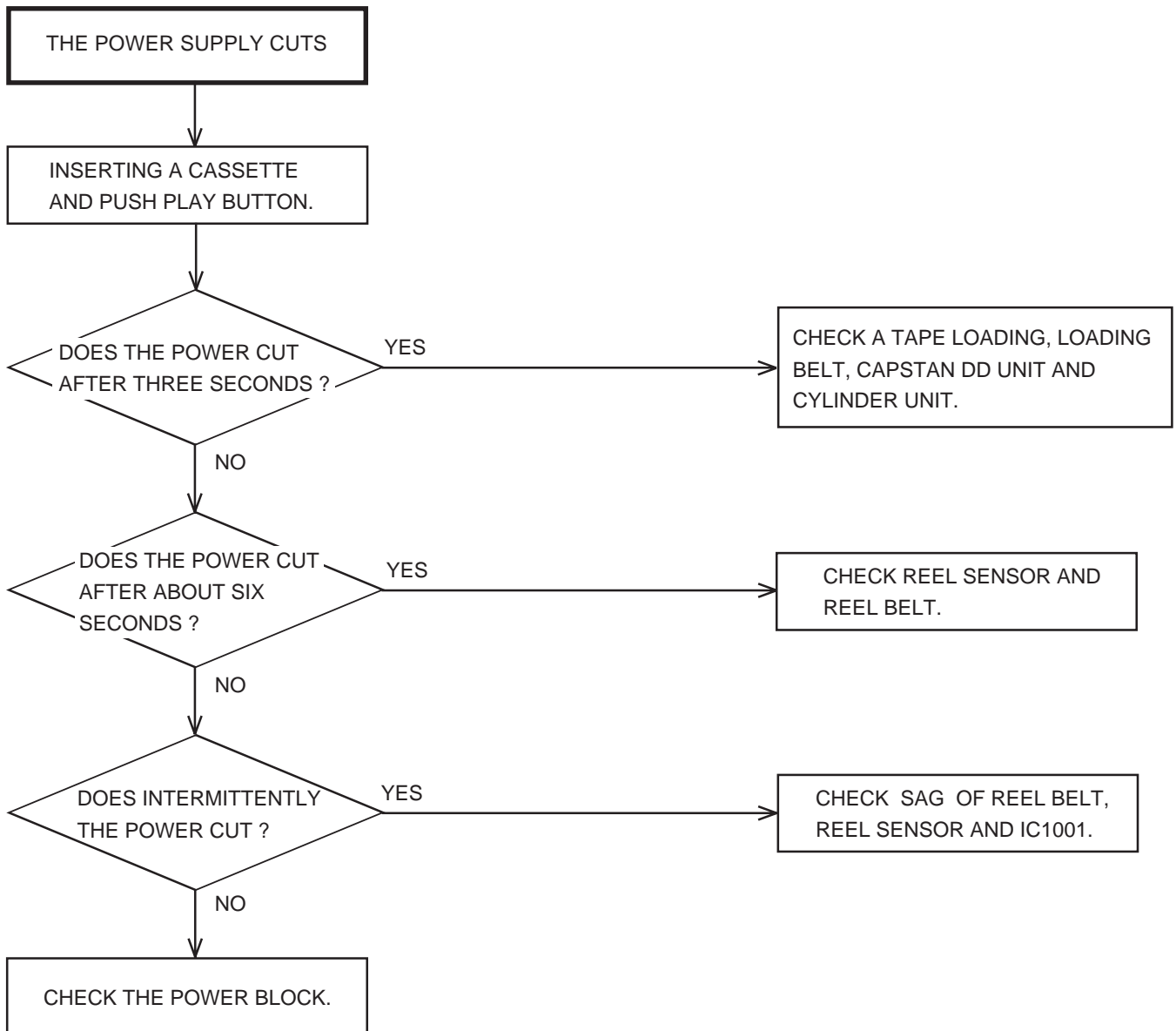
2. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE



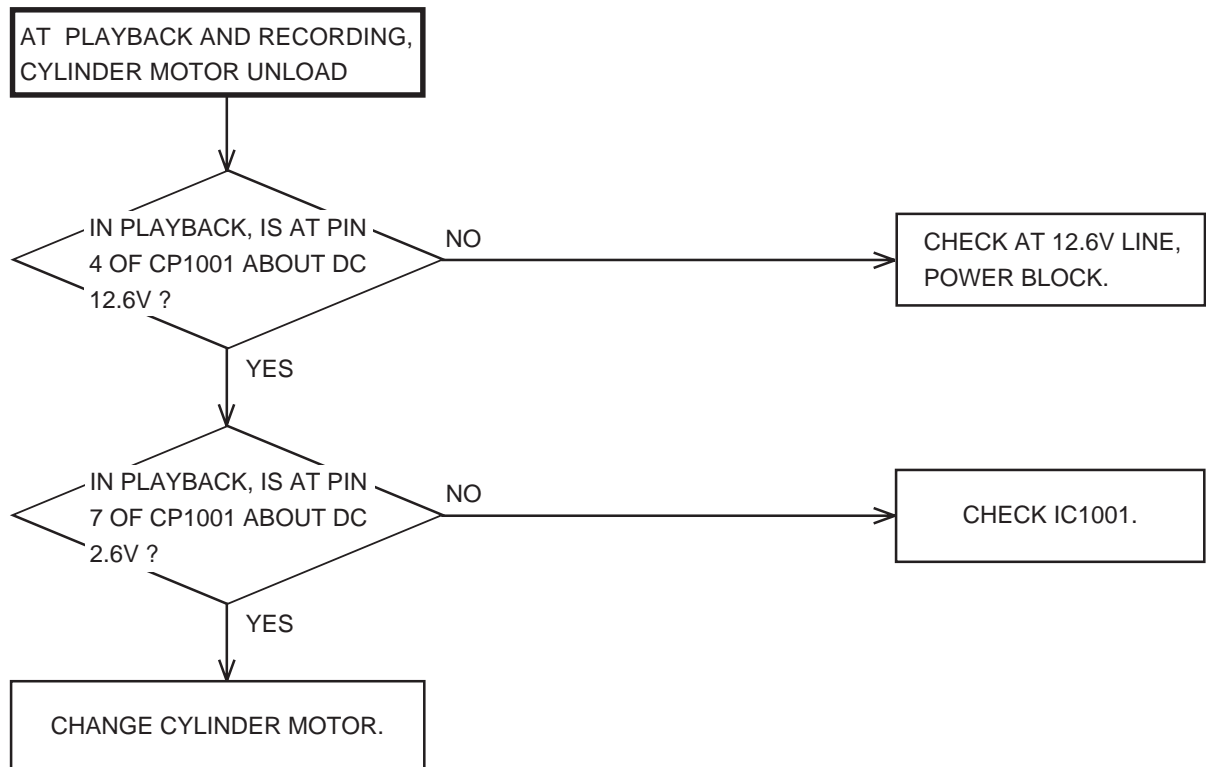
TROUBLESHOOTING GUIDE



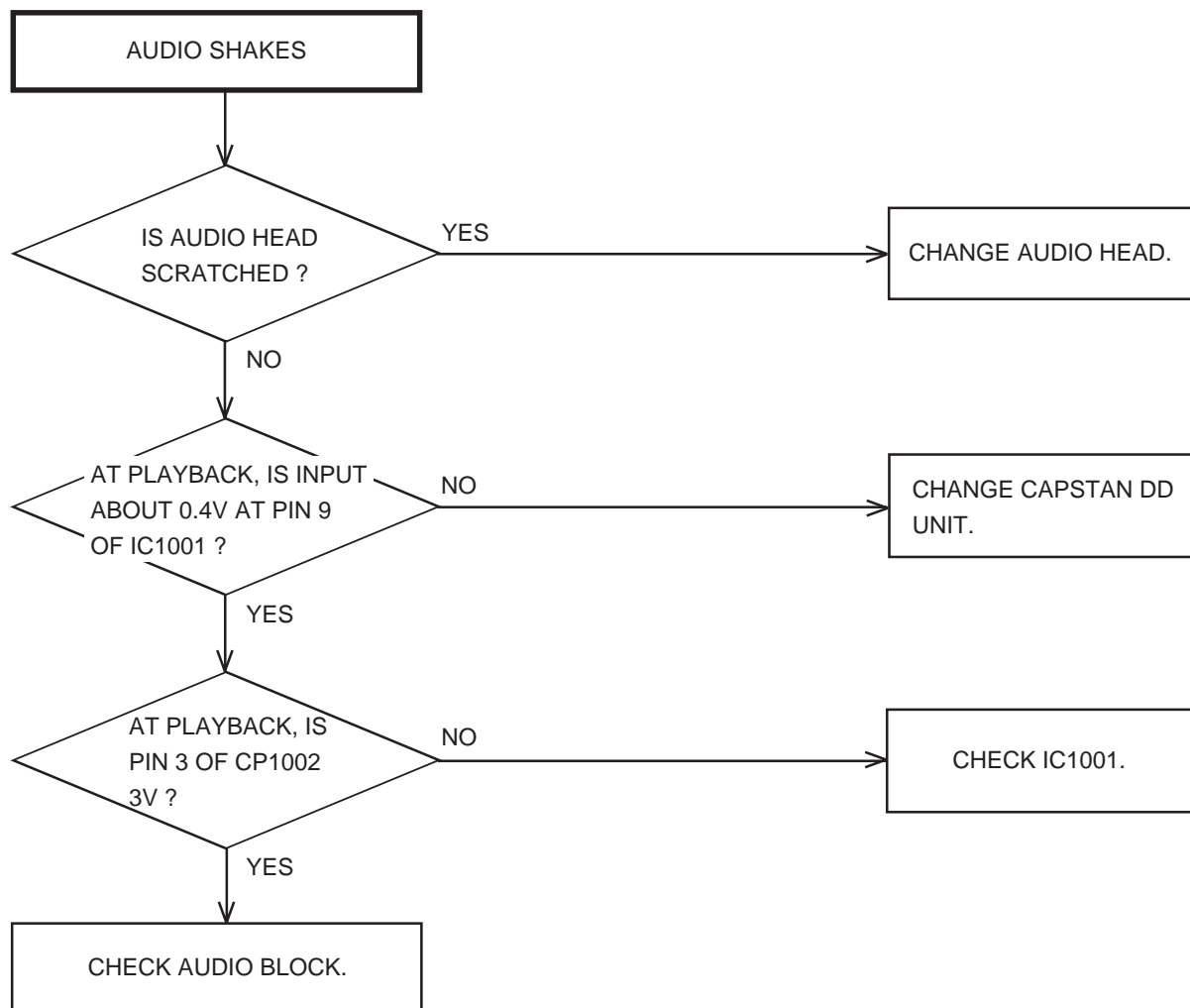
TROUBLESHOOTING GUIDE



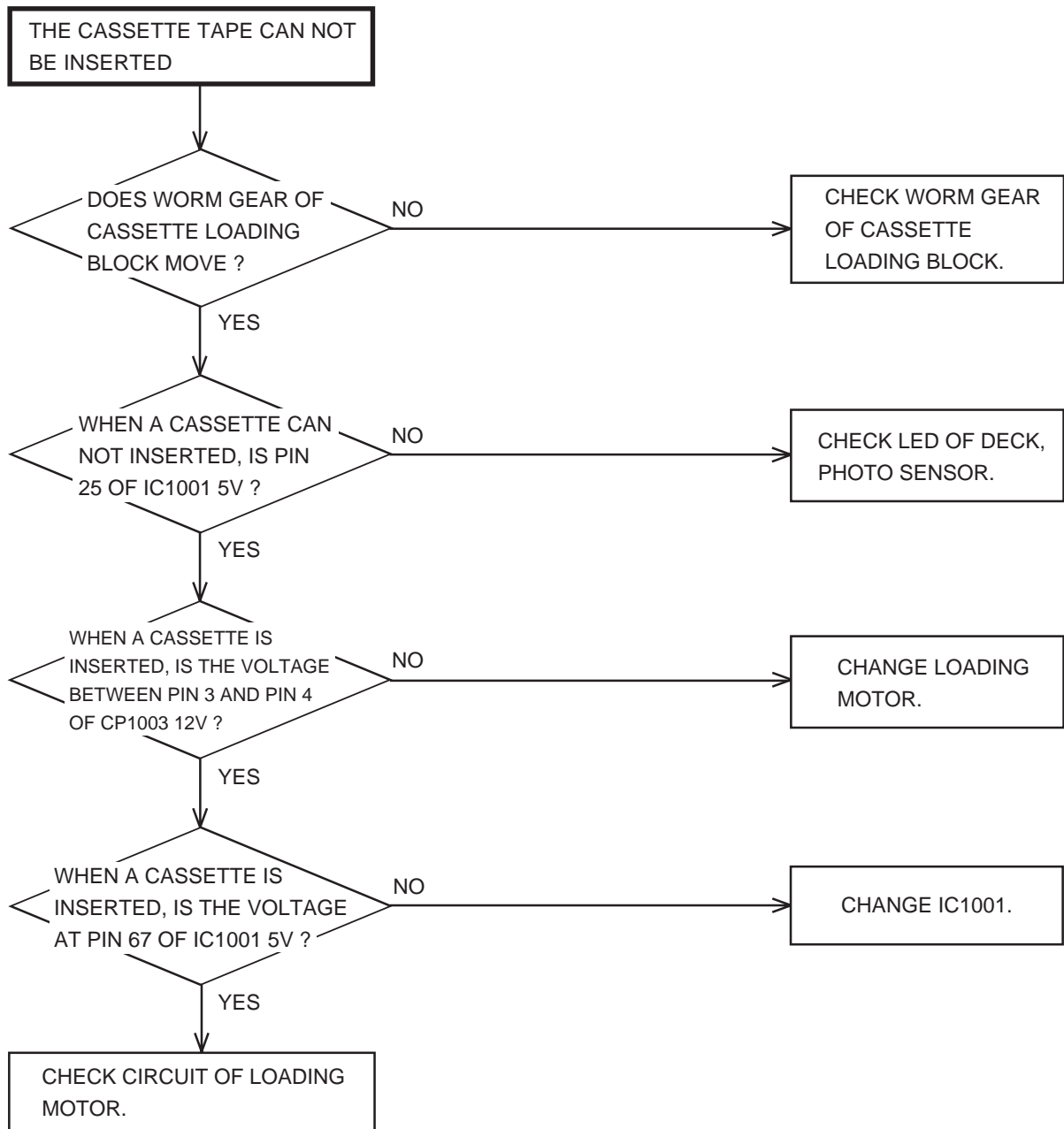
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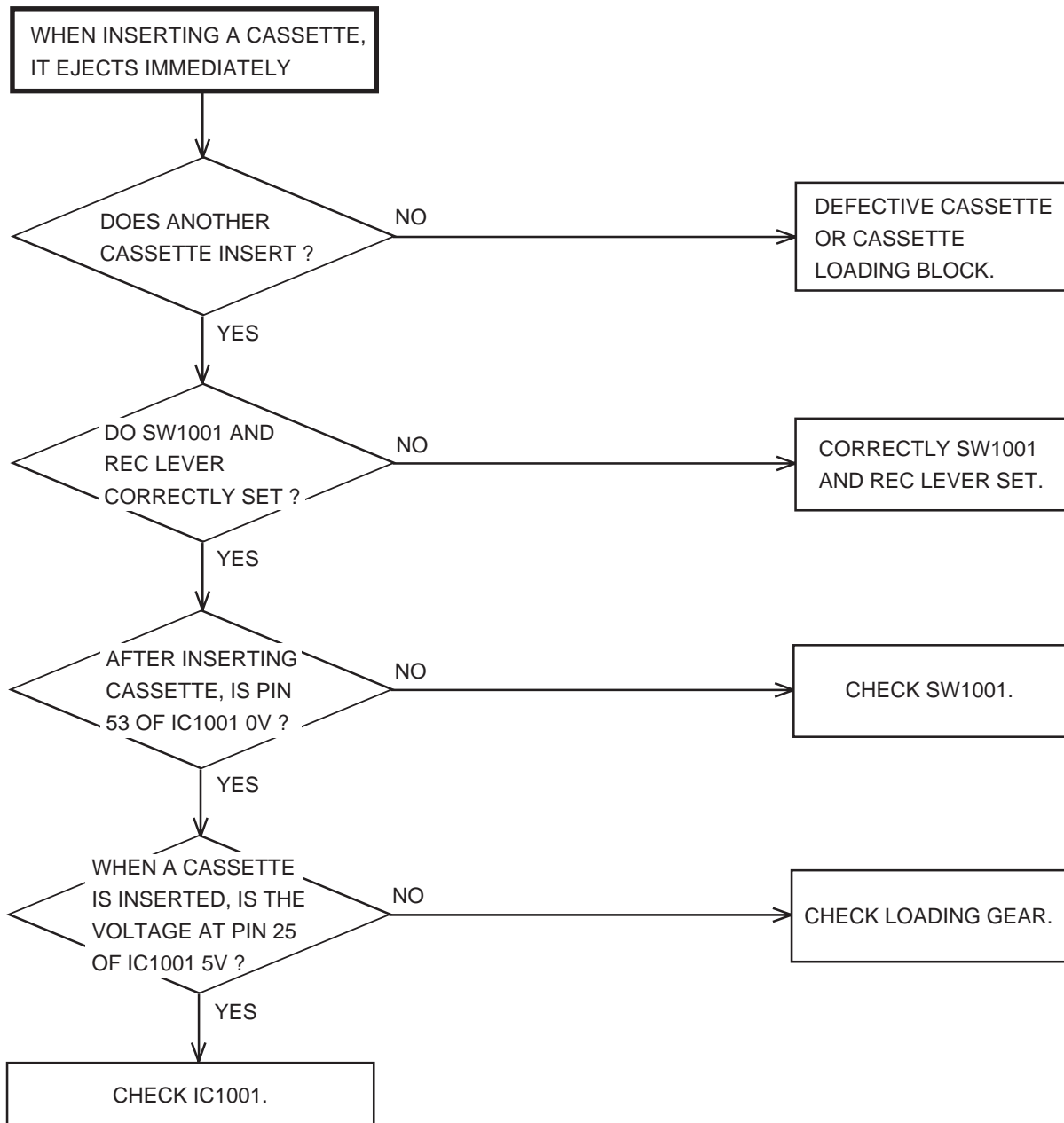
TROUBLESHOOTING GUIDE



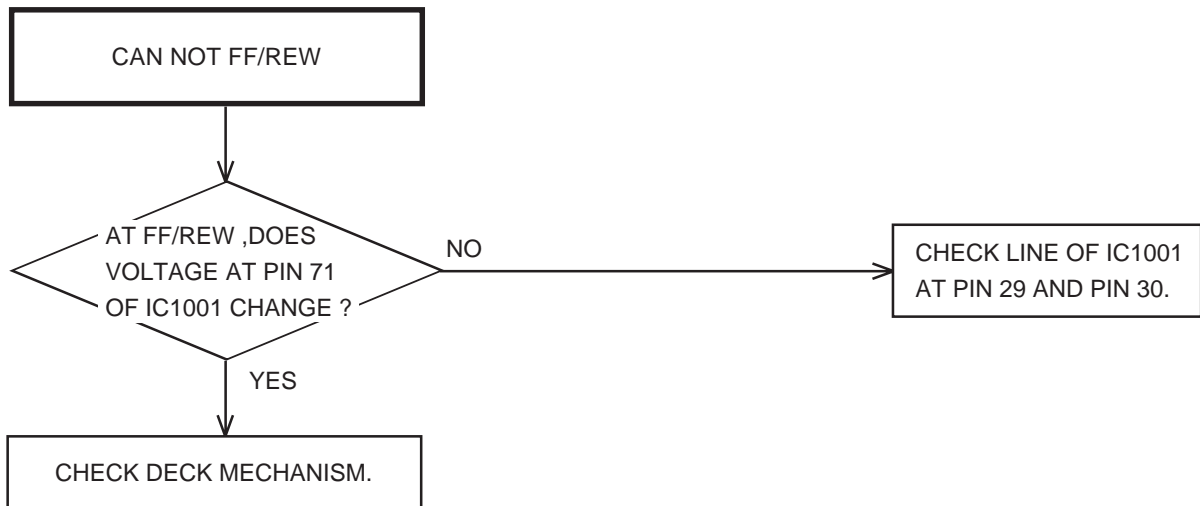
TROUBLESHOOTING GUIDE



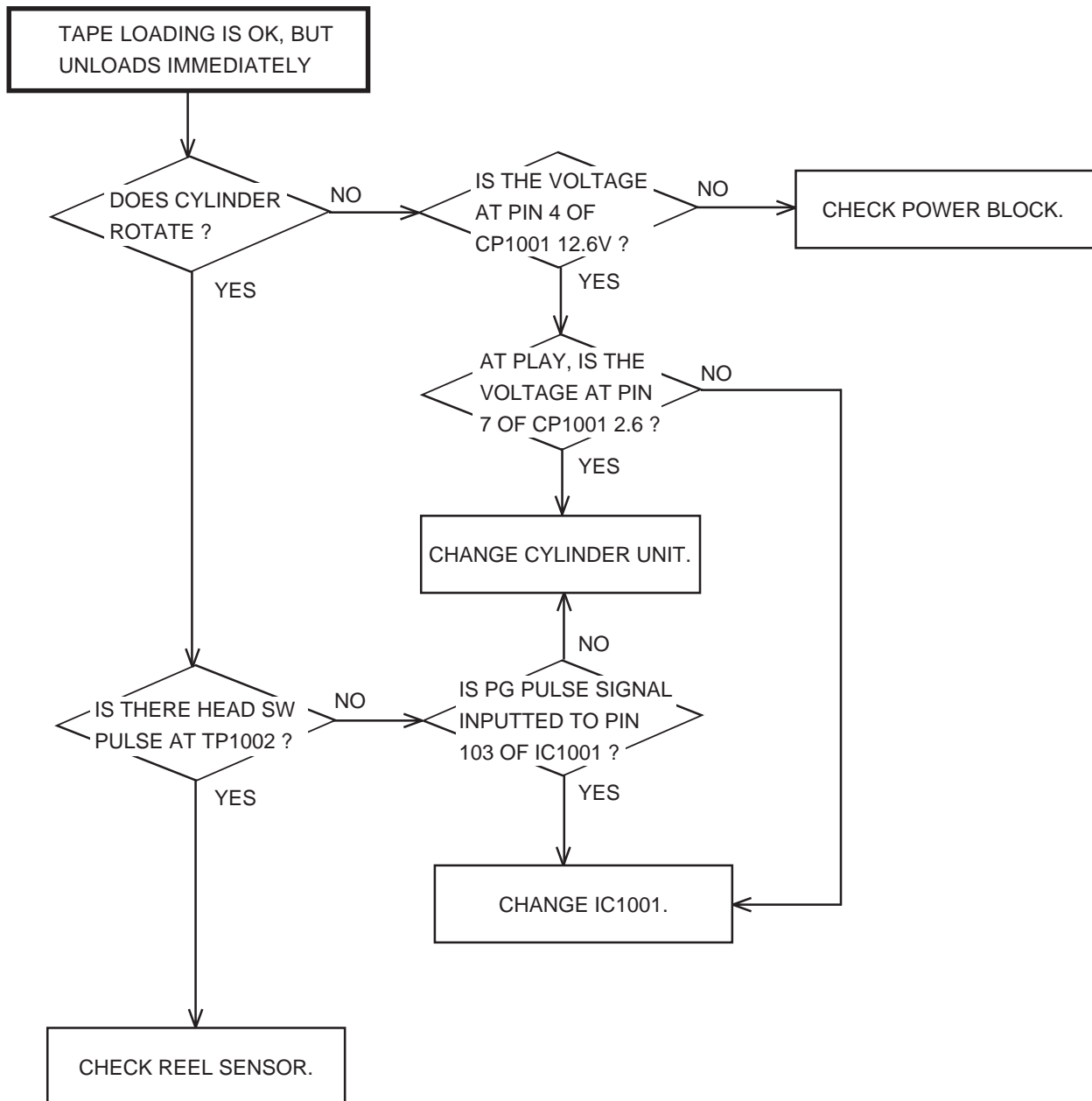
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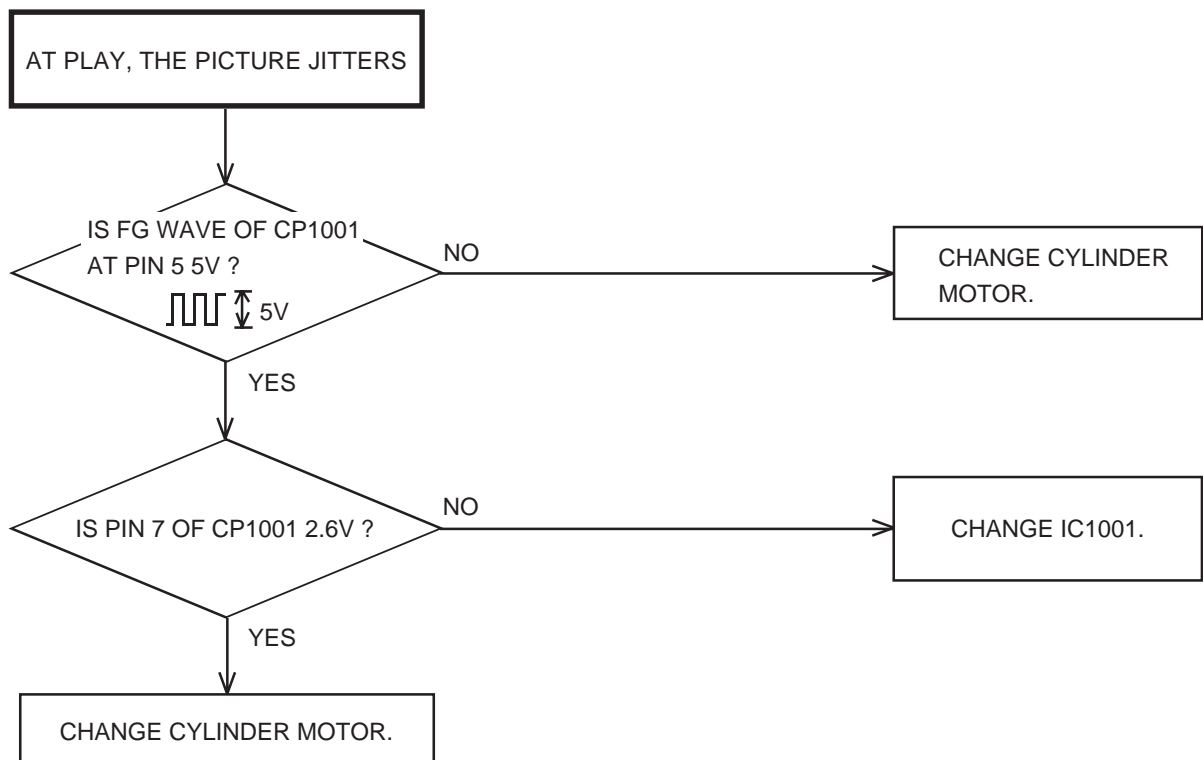
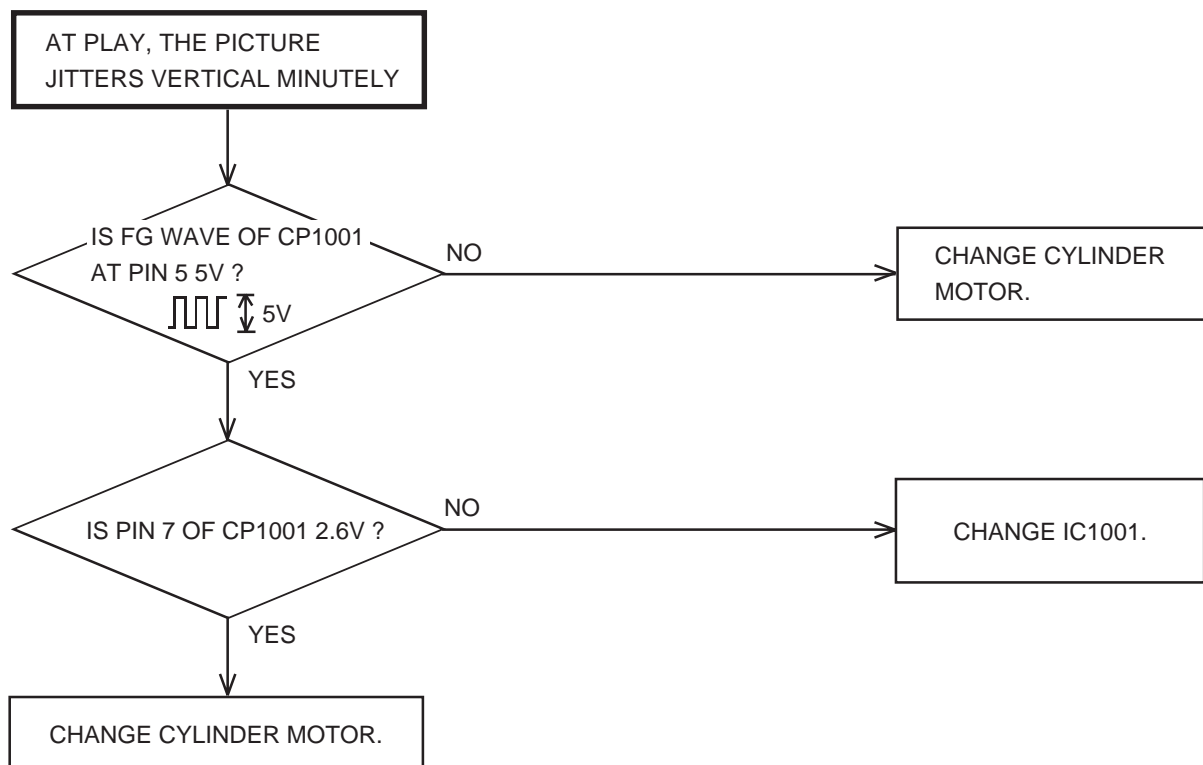
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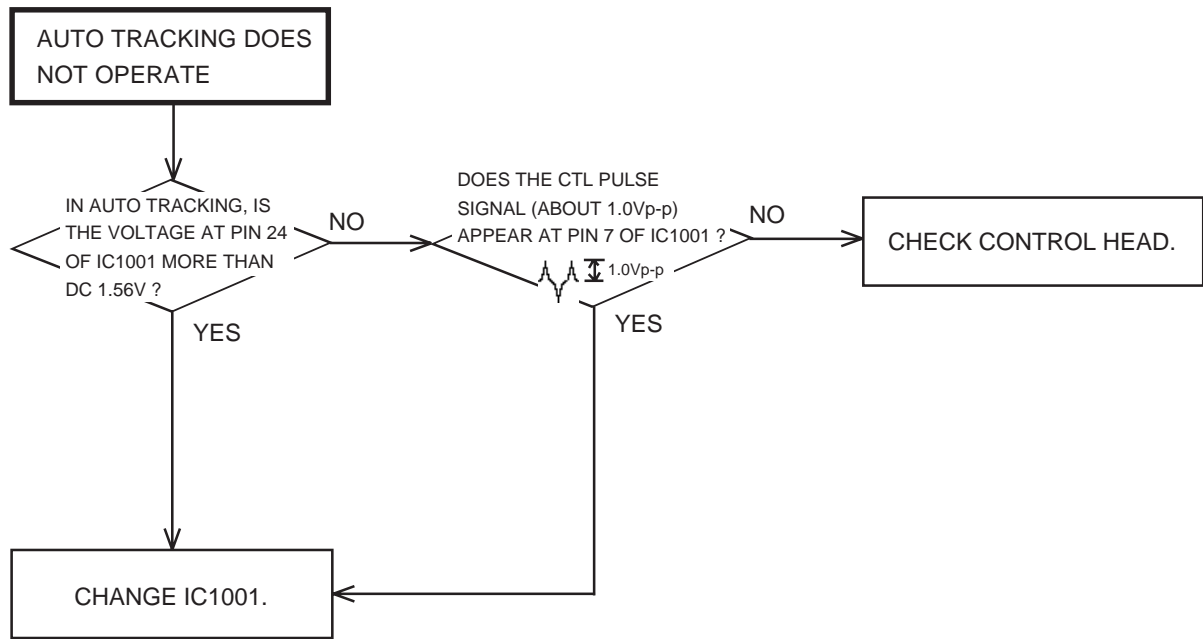
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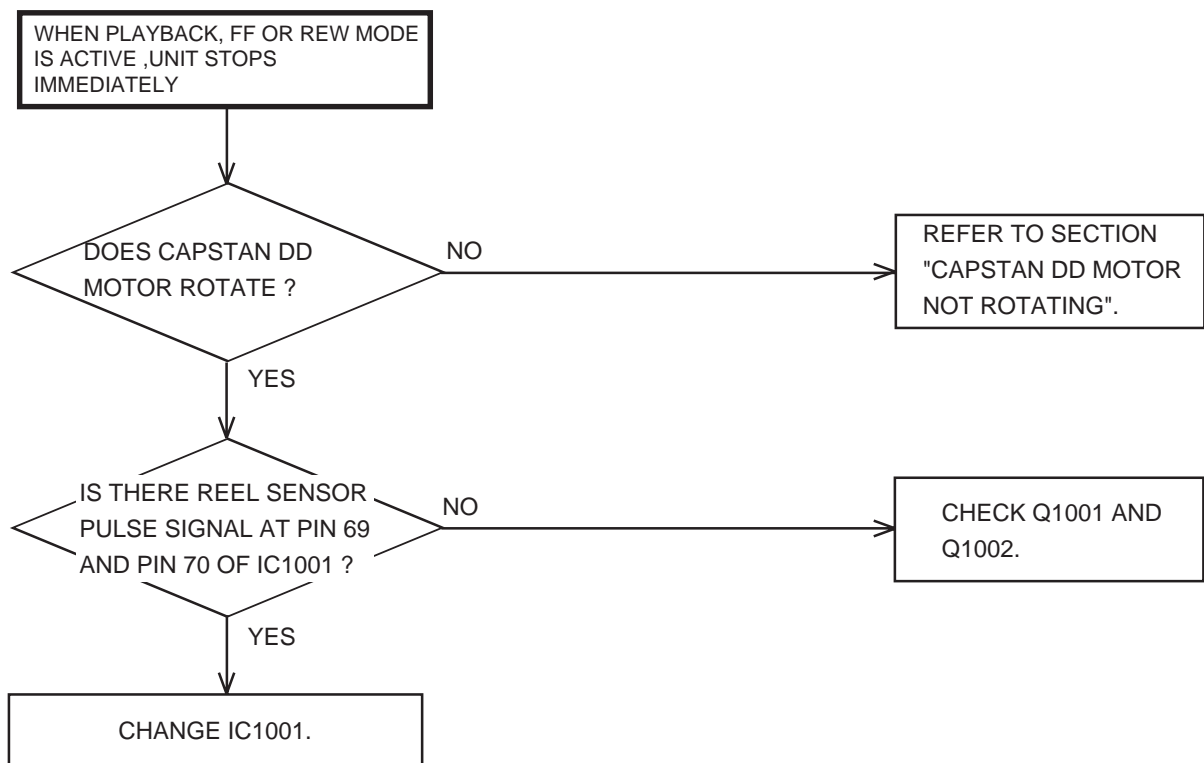
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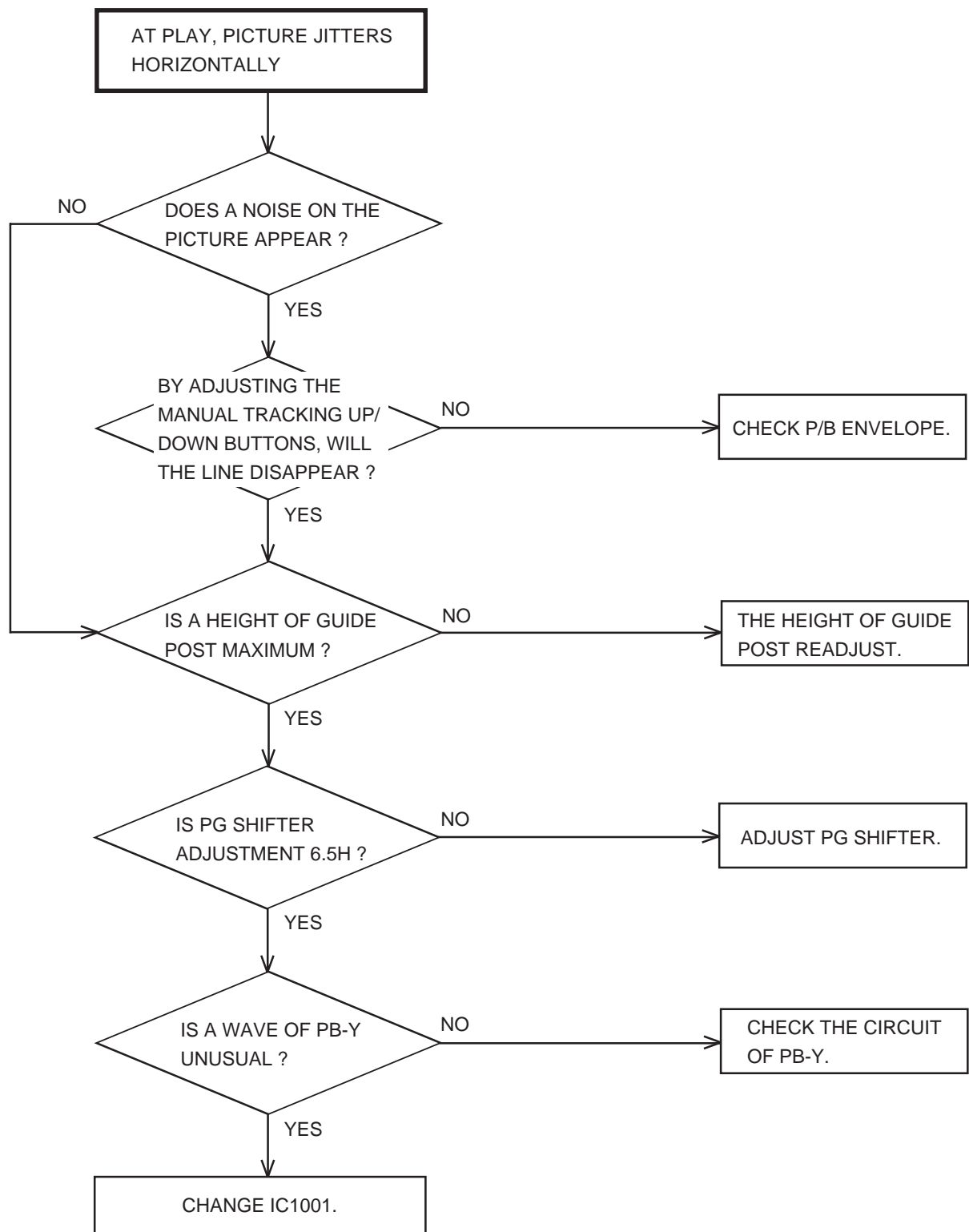
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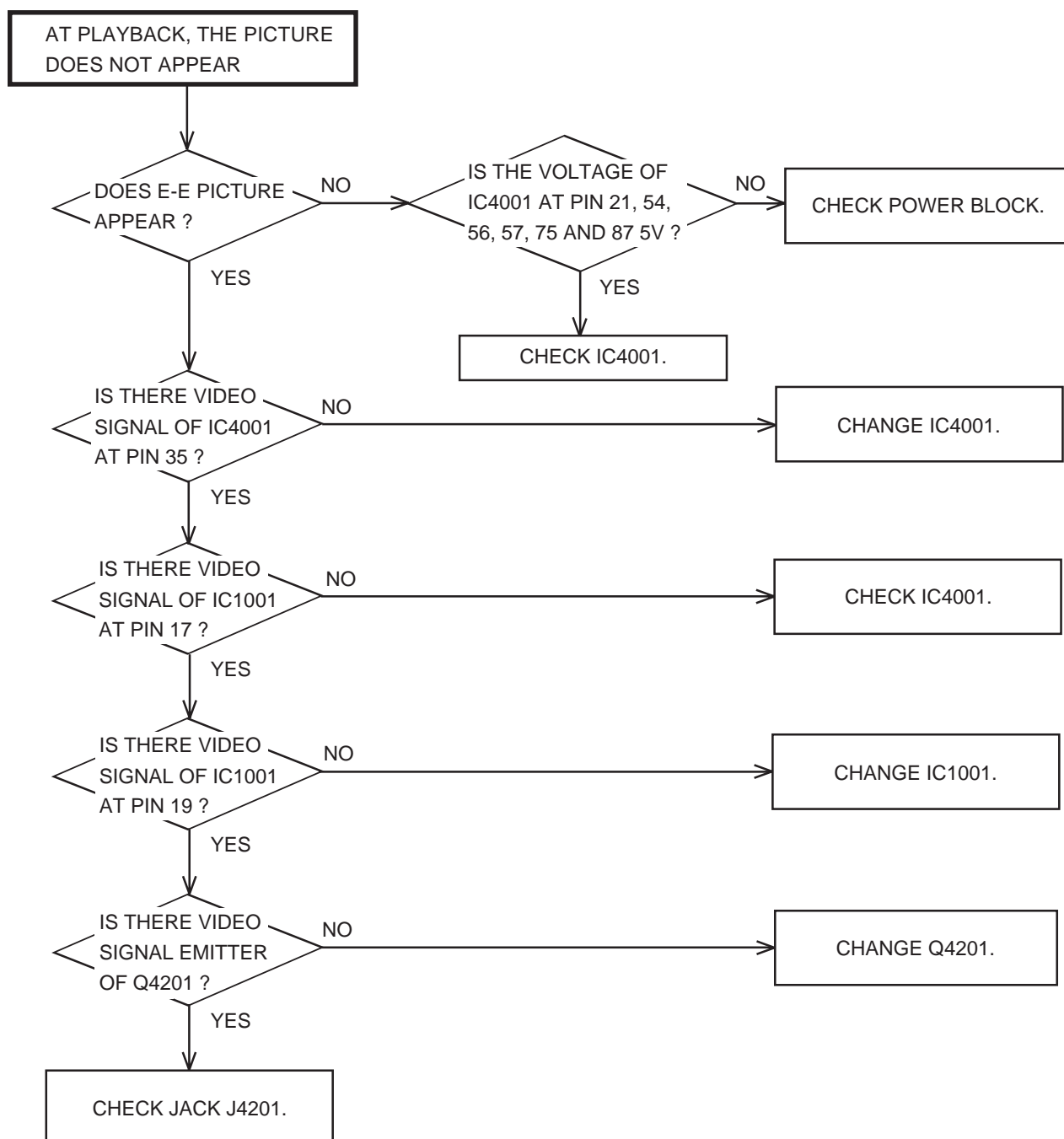
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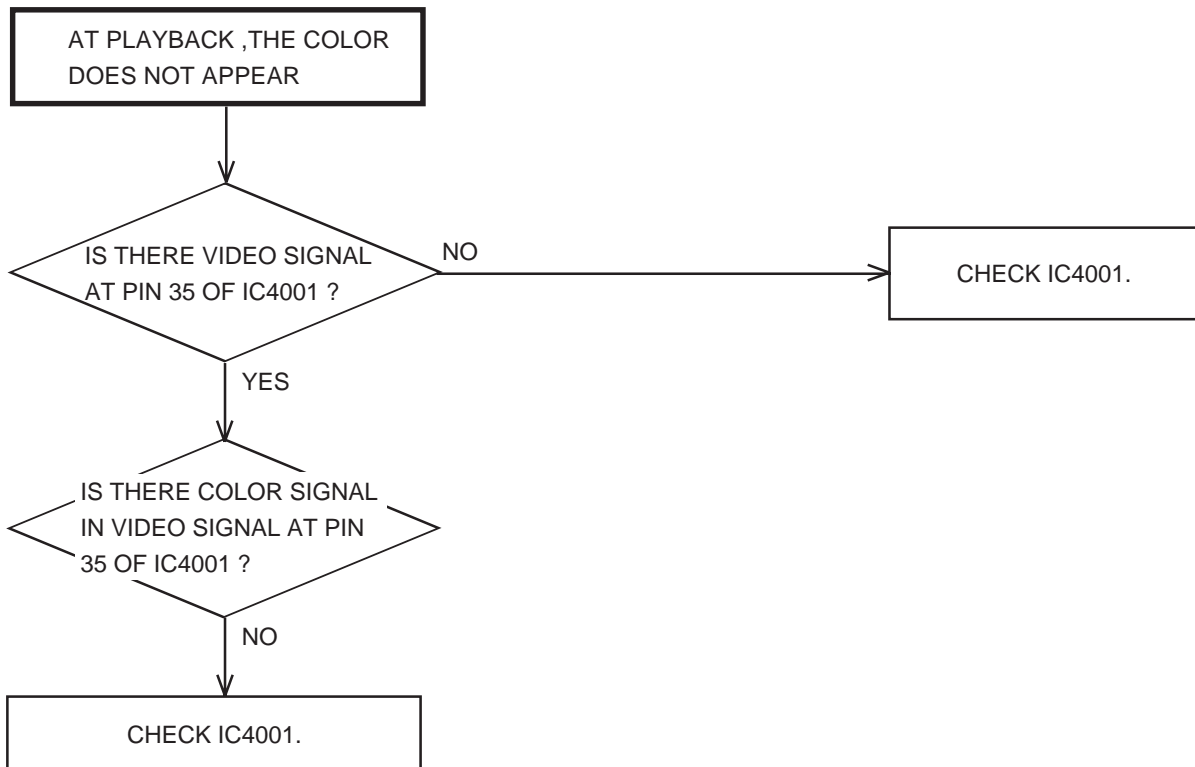
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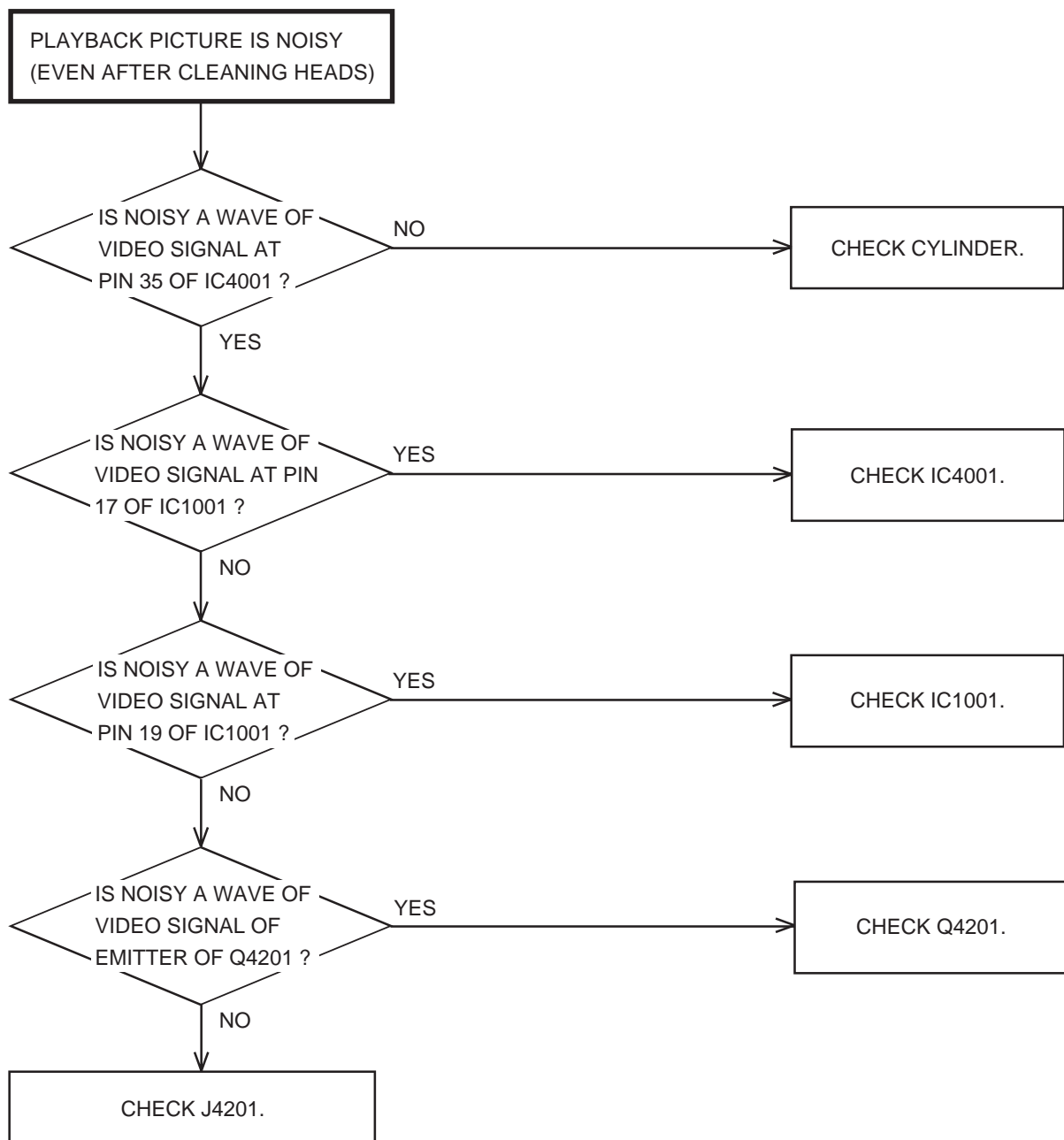
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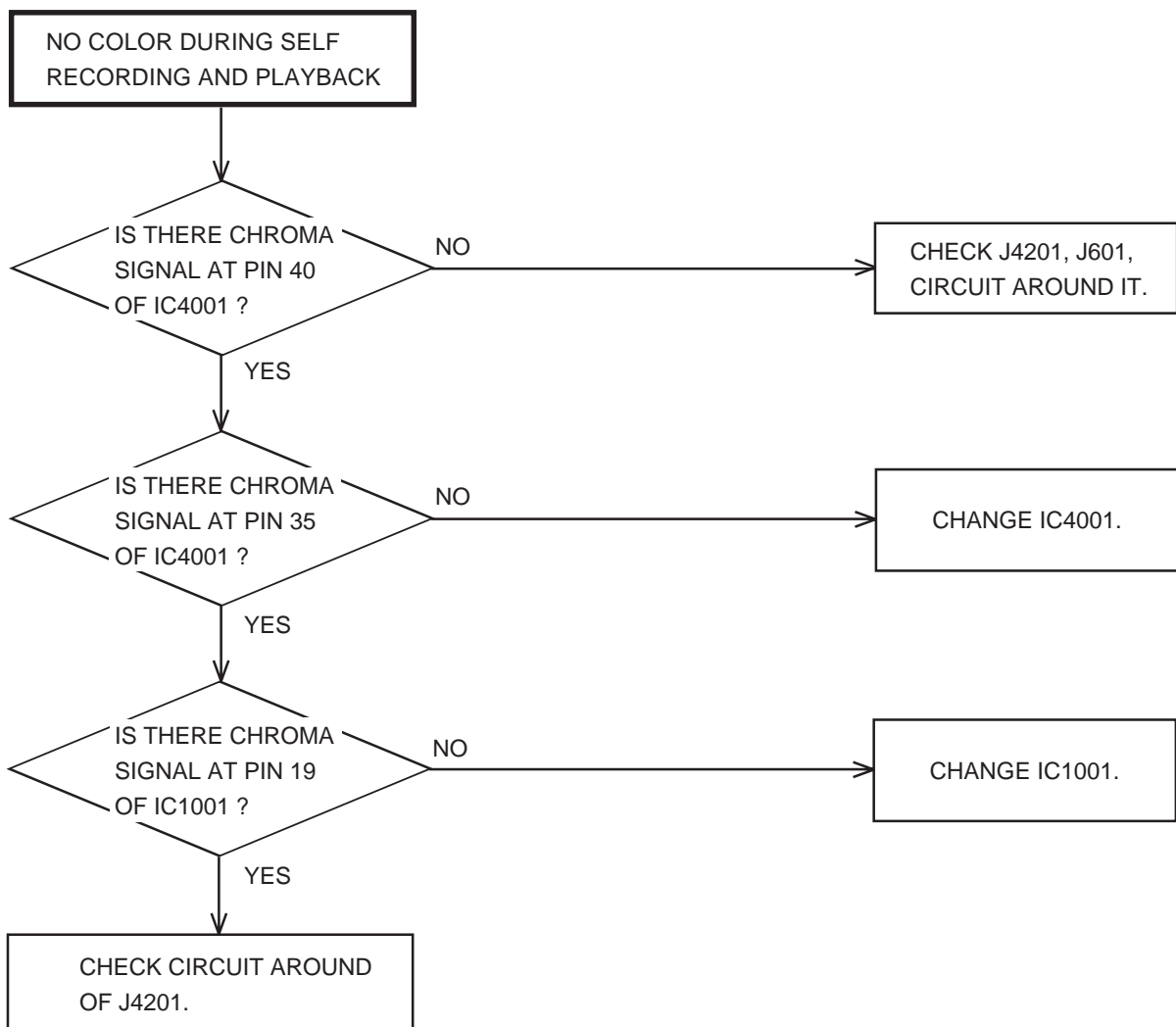
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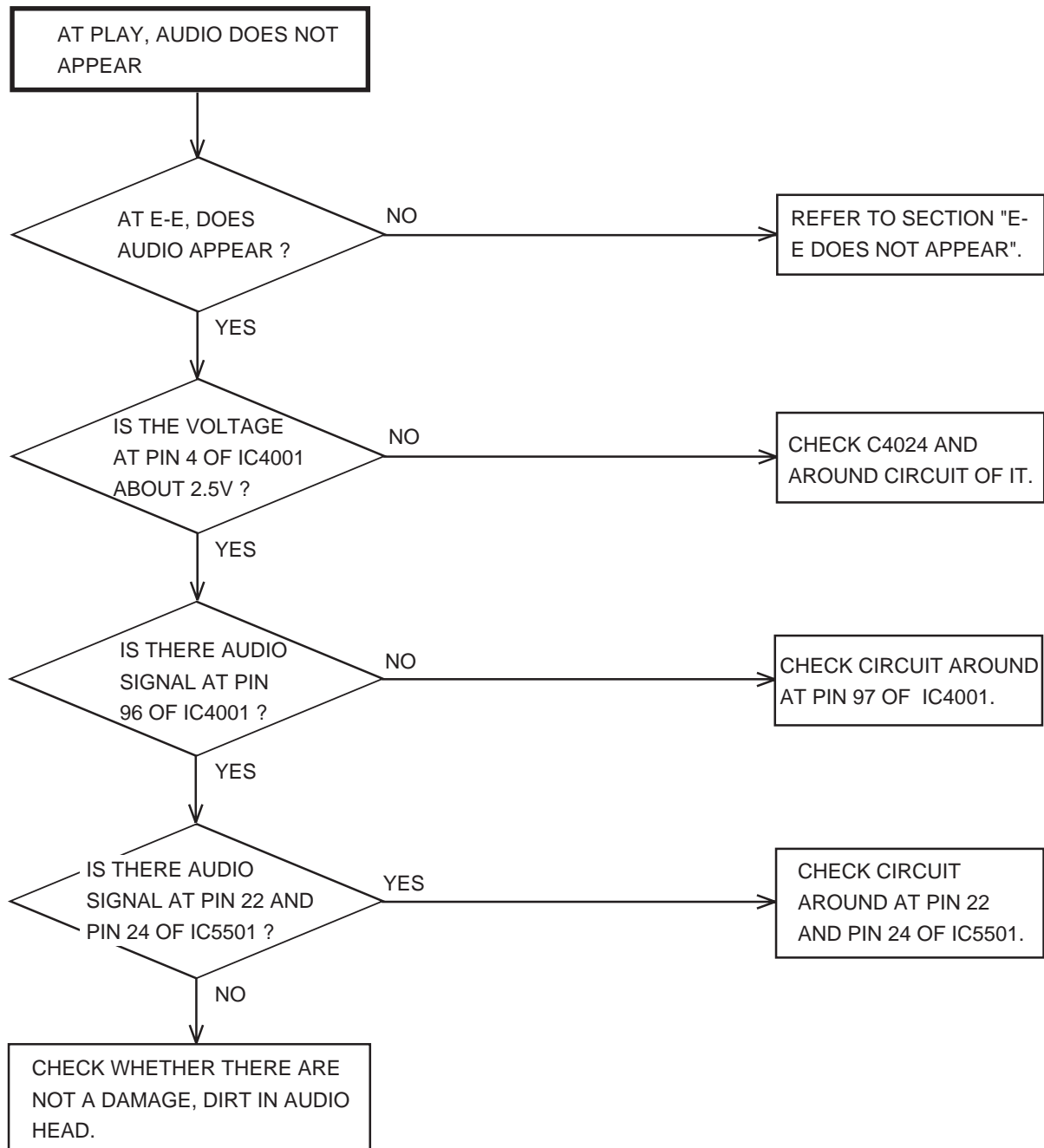
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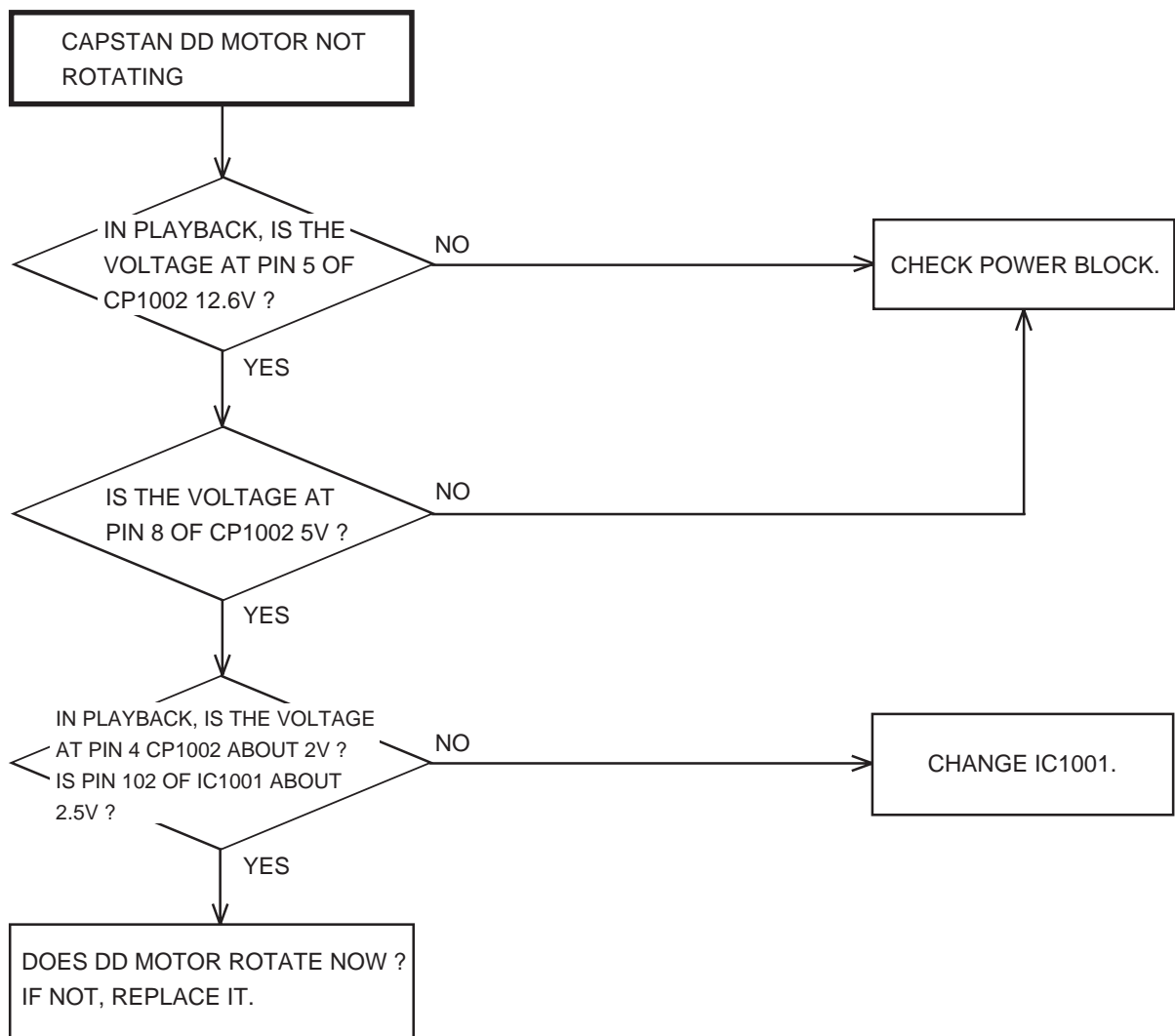
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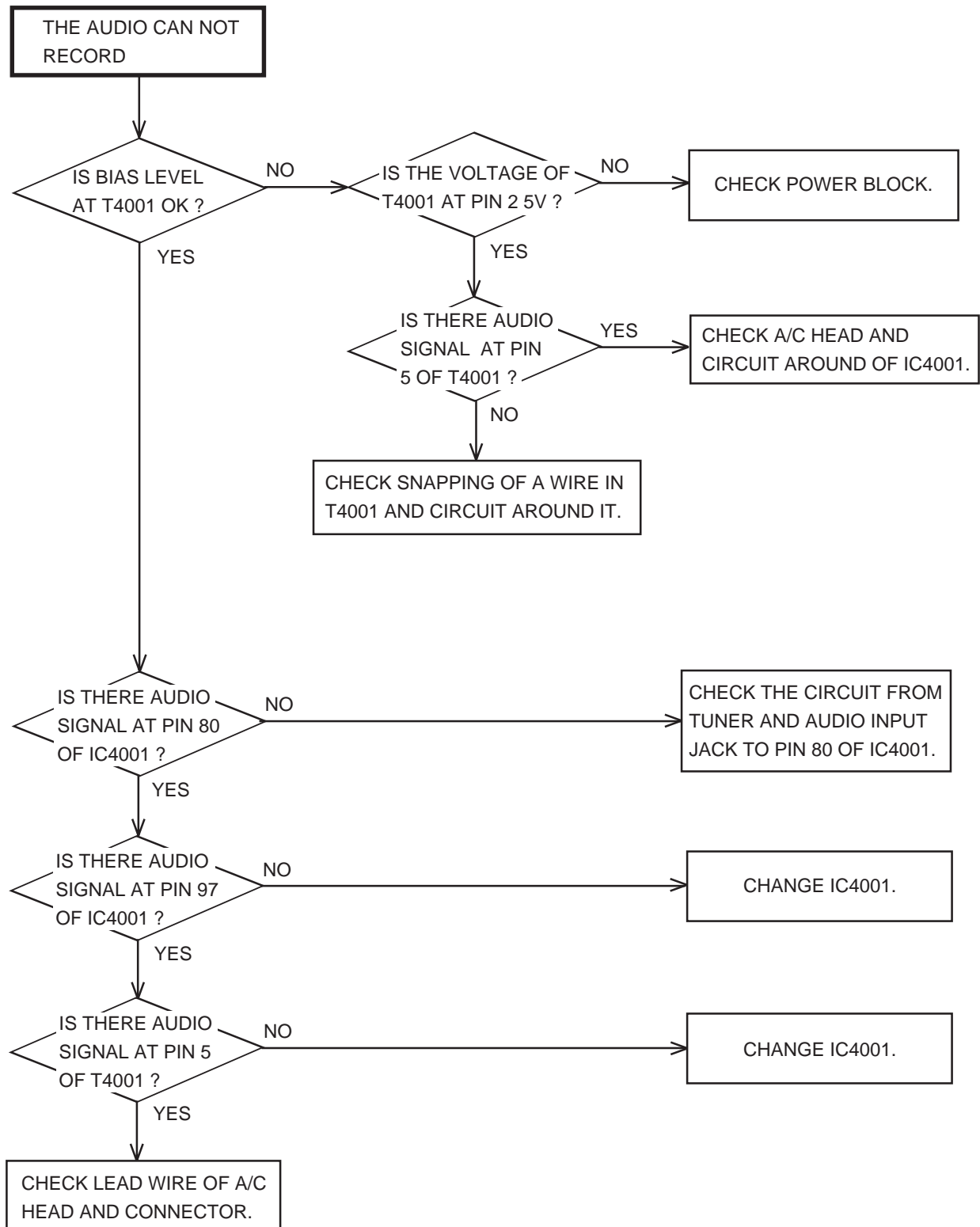
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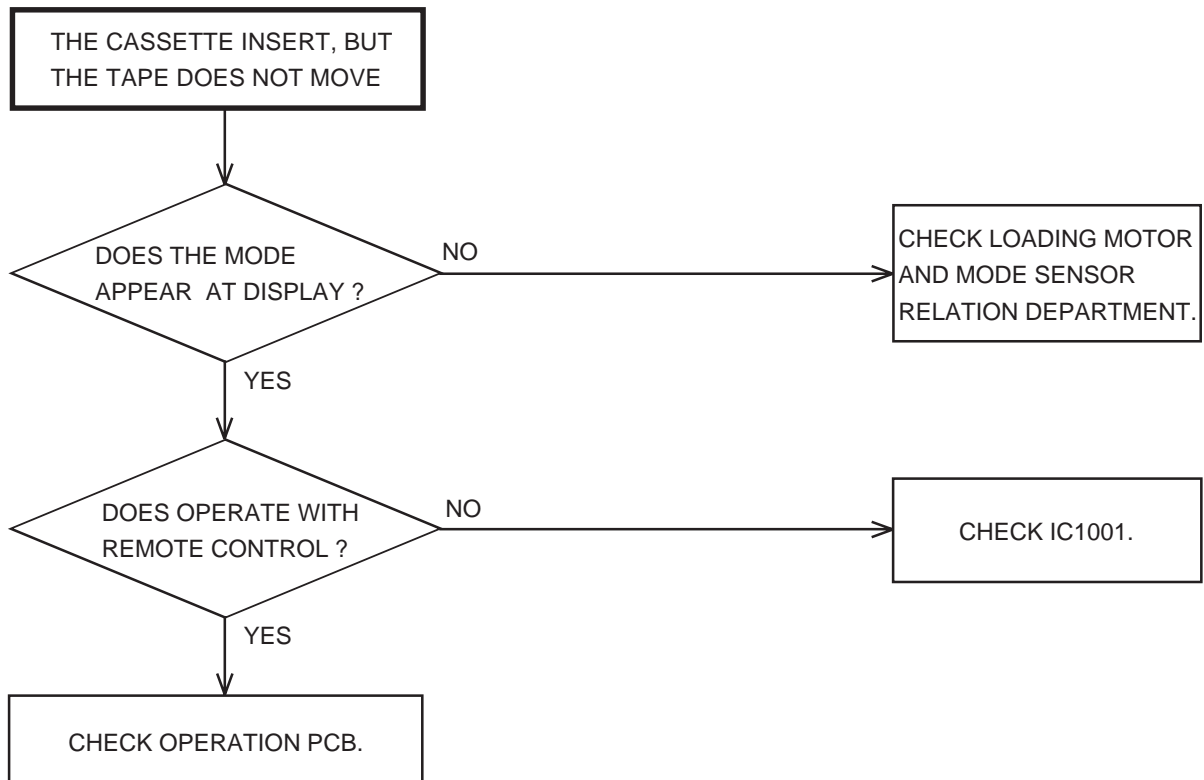
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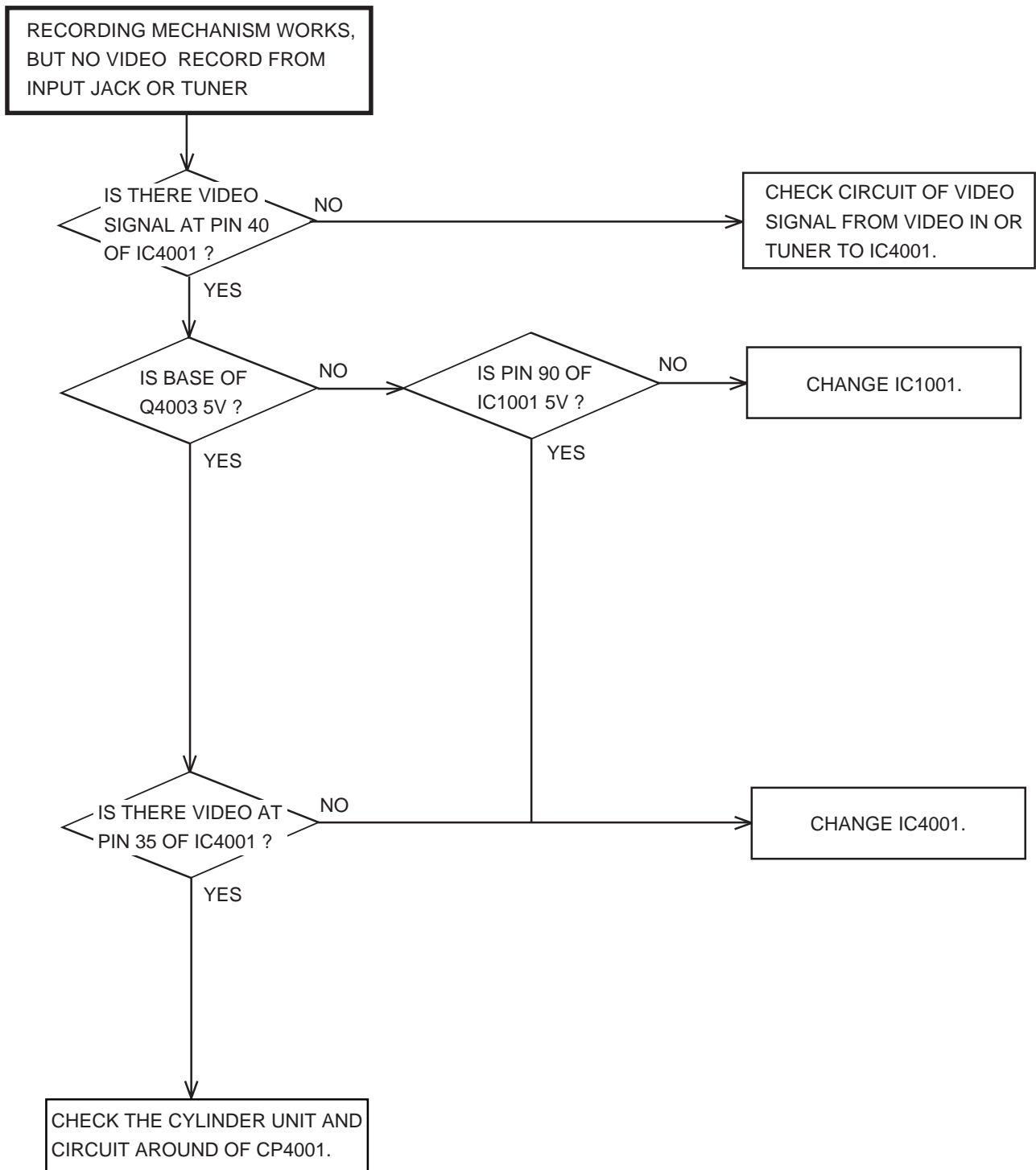
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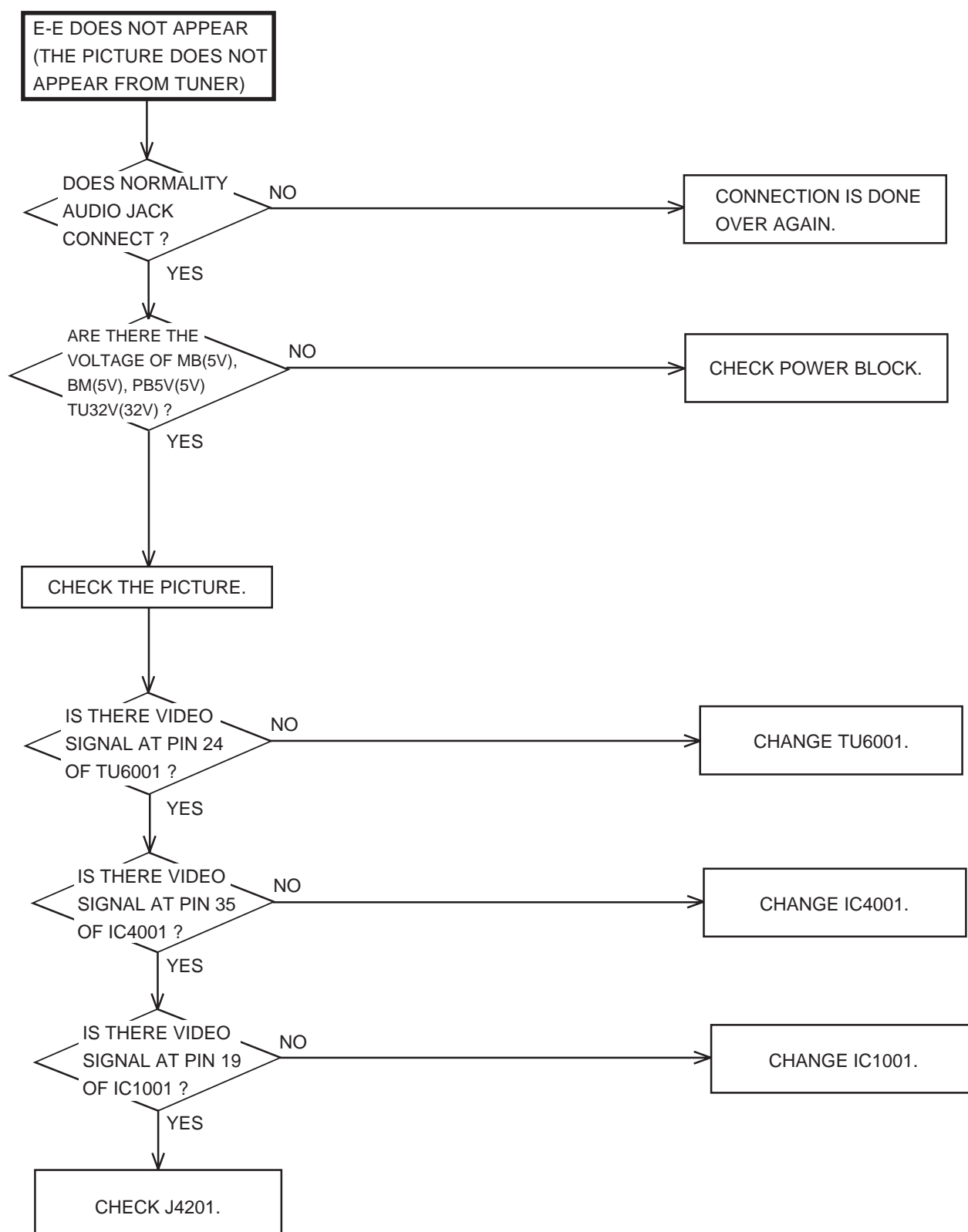
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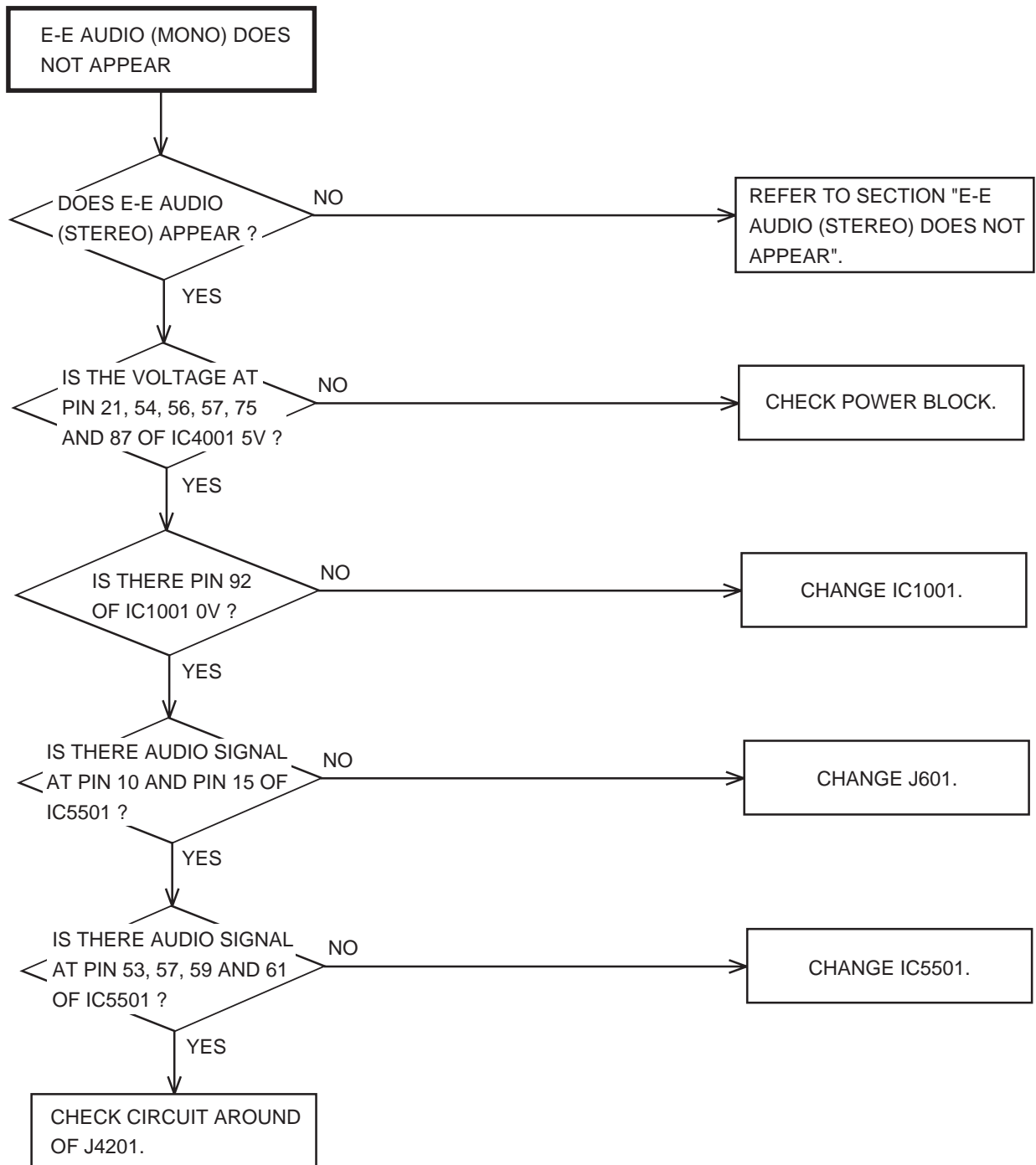
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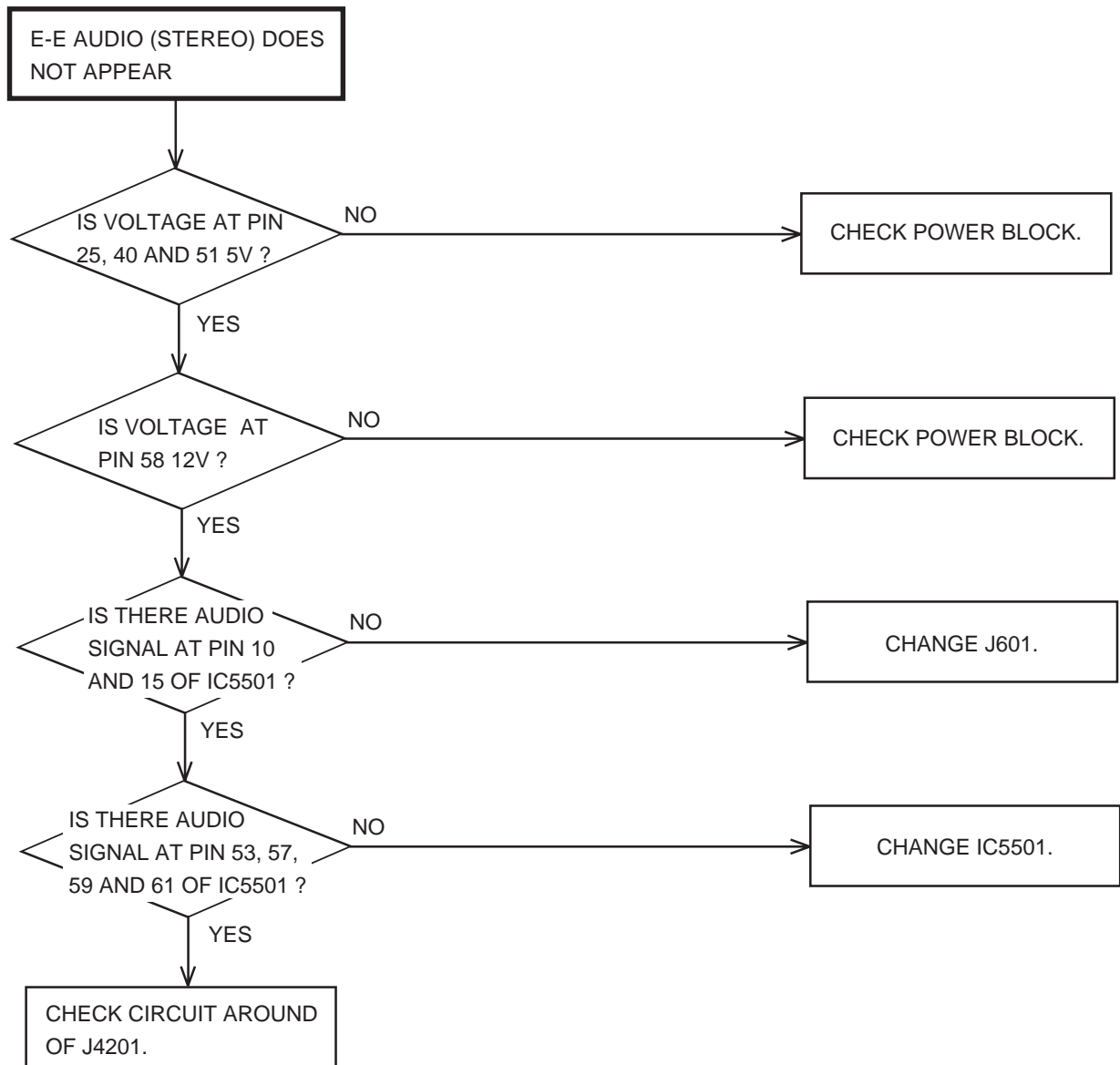
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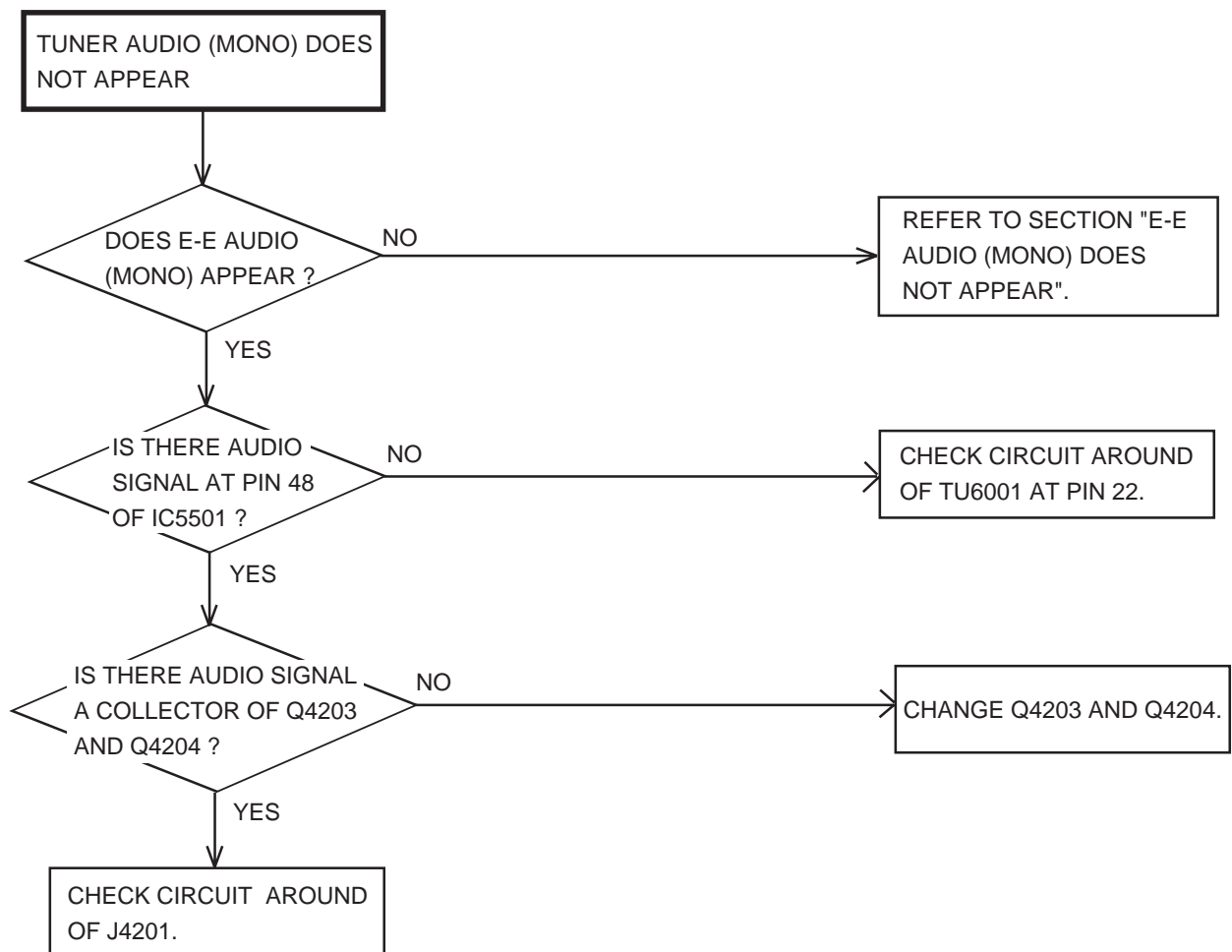
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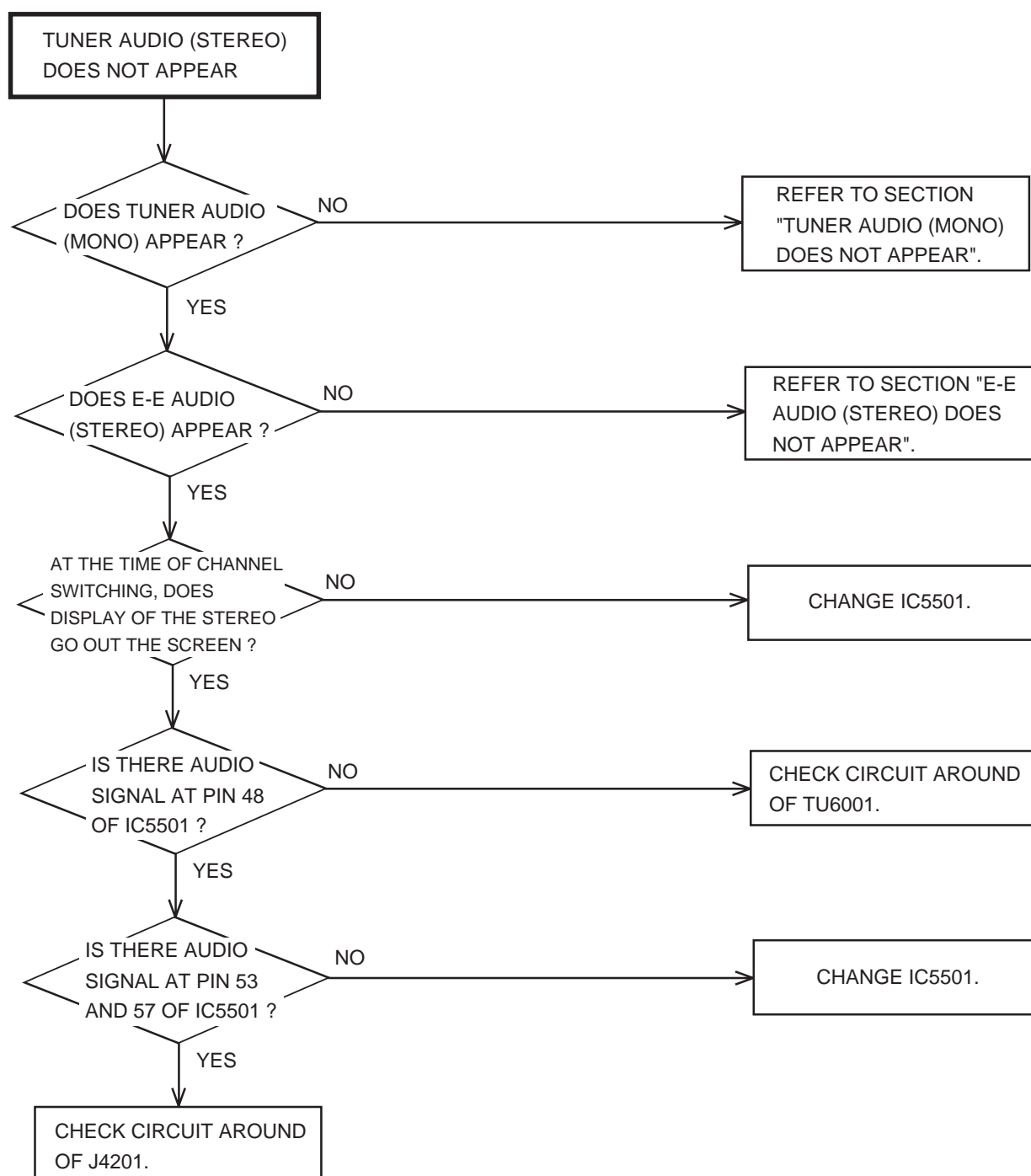
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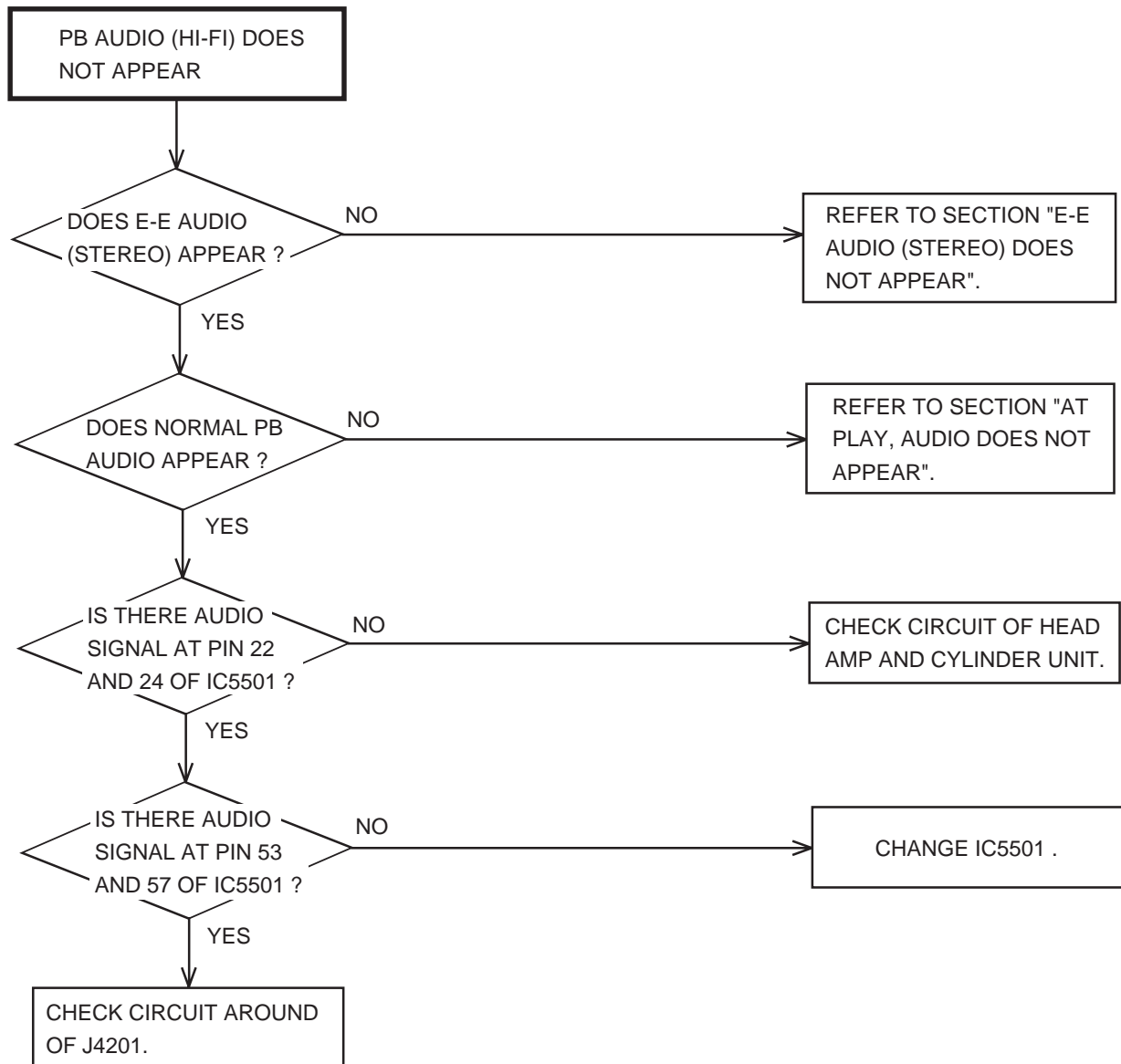
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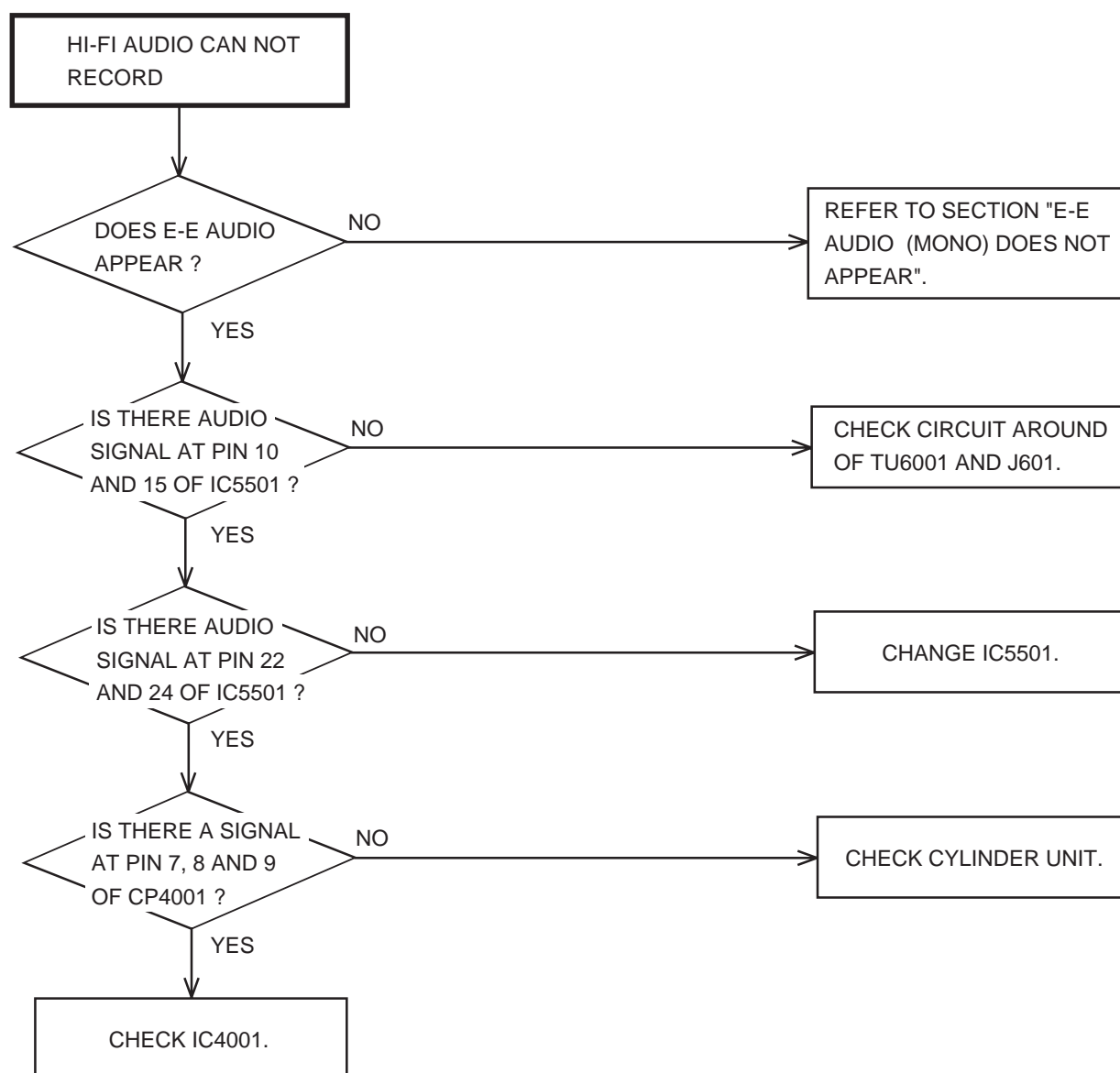
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



IC DESCRIPTIONS

OEC0090A (IC1001)

No.	PORT	PIN NAME	I/O	DESCRIPTION
1	SVSS	SVSS	—	Ground.
2	CTLREF	CTLREF	OUT	Output terminal for AMP REFERENCE.
3	CTL(+)	CTL(+)	I/O	Input and output terminal of Control Head.
4	CTL(-)	CTL(-)	I/O	Input terminal of Control Head.
5	CTLBIAS	CTLBIAS	IN	Input terminal for Control Bias.
6	CTLFB	CTLFB	IN	Input terminal for Control Feedback.
7	CTLAMP(O)	CTLAMP(O)	OUT	Output terminal for Control Amp Output.
8	CTLSMT(I)	CTLSMT(I)	IN	Input terminal for Control SMT Input.
9	CFG	CFG	IN	Input terminal for Capstan FG input.
10	SVCC	SVCC	—	P.CON +5 V.
11	AFCPC	AFCPC	IN	Condenser connection for AFC PC.
12	AFCOSC	AFCOSC	IN	Condenser connection for AFC OSC.
13	AFCLPF	AFCLPF	IN	Condenser connection for AFC LPF.
14	C.SYNC/H.SYNC	C.SYNC	OUT	Output terminal for composite C SYNC.
15	V.SYNC	V.SYNC	IN	Input terminal for video V.SYNC signal.
16	CVIN2	CVIN2	IN	Input terminal for video signal.
17	CVIN1	CVIN1	IN	Input terminal for video signal.
18	OSDVCC	OSDVCC	—	AT +5 V.
19	CVOUT	CVOUT	OUT	Output terminal for video signal.
20	OSDVSS	OSDVSS	—	Ground.
21	4/2FSCOUT	4FSCOUT	OUT	4 FSC pulse.
22	4/2FSCIN	4FSCIN	IN	4 FSC pulse.
23	AVSS	AVSS	—	Ground.
24	ANB	VIDEO_ENV	IN	Input terminal of Video RF envelope.
25	ANA	BOT	IN	Tape start sensor input signal.
26	AN9	EOT	IN	Tape end sensor input signal.
27	AN8	MSEN_B	IN	Main unit key input.
28	AN7	MSEN_A	IN	
29	AN6	KEY_B	IN	
30	AN5	KEY_A	IN	
31	AN4	STEREO SEL	IN	Input terminal of stereo selector.
32	AN3	Hi-Fi_ENV	IN	Input terminal of HIFI sound envelope signal.
33	AN2	AFT.S.CURVE	IN	AFT S.CURVE input for tuner.
34	P01/AN1	P01/AN1	IN	Not used.
35	P00/AN0	P00/AN0	IN	
36	AVCC	AVCC	—	AT +5 V.
37	P10/IRQ0	POWER_FAIL	IN	50/60 Hz pulse input made by AC power.
38	P11/IRQ1	NC	OUT	Not used.
39	P12	P12	IN	AT +5 V.
40	P13	P13	IN	
41	P14	P14	IN	
42	P15	HEAT SW	OUT	Not used.
43	P16/IC	REMOCON IN	IN	Receive the remote control signal input.

IC DESCRIPTIONS

OEC0090A (IC1001)

No.	PORT	PIN NAME	I/O	DESCRIPTION
44	P17	32KHz_MONITOR	OUT	Not used.
45	P67	OTPB_LED	OUT	Output terminal control for OTPB-LED voltage drive.
46	P66	STBY_LED	OUT	Not used.
47	P65	NC	OUT	
48	P64	CYL_SPEED_UP	OUT	Output terminal for correct cylinder during SLOW.
49	P63	MS_SENS_CTL	OUT	Output terminal to drive sensor control.
50	P62	POWER_ON-L	OUT	For control of the user power switch ON/OFF.
51	P63	POWER_ON-H	OUT	
52	P60	TRICK_PB/EE_H	OUT	Special effect playback.(CUE/REVIEW/STILL/SLOW etc)
53	P37	TAB_SW	IN	Input terminal for judge the tape if it has TAB or not.
54	P36	SERVICE	IN	Input terminal for Service Mode.
55	P35	FL_CS	OUT	Timing output of data transmission and receiving with FIP drive.
56	VCC	VCC	—	AT +5V.
57	VSS	VSS	—	Ground.
58	P27	NC	OUT	Not used.
59	SCL0	IIC_CLK_0	OUT	
60	SDA0	IIC_DATA_0	OUT	Output Data terminal for I2CBUS communivation.
61	P24	NC	OUT	Not used.
62	P23	NC	OUT	
63	SCK1	FL_CLK	OUT	Timing output of data transmission and receiving with FIP drive.
64	SO1	SO1/FL_SD_OUT	OUT	Indication data and mode transmission to FIP drive.
65	SI1	SI1	IN	Input terminal of DATA FZTAT input.
66	P47	NC	OUT	Not used.
67	P46	LDM_FWD	OUT	Output signal to control the rotation direction of the loading motor.
68	P45	LDM_RVS	OUT	
69	P44	REEL-S	IN	Input terminal of reel sensor SUPPLY.
70	P43	REEL-T	IN	Input terminal of reel sensor TAKE UP.
71	P42	CAP_FWD-L	OUT	Capstan forward and backward command.
72	P41	JUST_CLOCK_IN	IN	Not used.
73	P40	VV-H	OUT	Output terminal for select Playback/Recording at the circuit of sound.
74	FWE	FWE	IN	Input terminal of FZTAT signal(L: low signal input).
75	X2	X2	OUT	Subclock pluse (32.768KHz).
76	X1	X1	IN	Subclock pluse (32.768KHz).
77	/RES	/RES	IN	RESET will be done when the voltage goes to HIGH after the restart signal.
78	OSC1	OSC1	IN	Connect the main crystal (10MHz).
79	VSS	VSS	—	Ground.
80	OSC2	OSC2	OUT	Connect the main crystal (10MHz).
81	VCL	VCL	IN	Condenser connection for VCC.
82	MD0	MD0	IN	Input terminal of FZTAT signal.
83	PWM2	CAP_LIMIT	OUT	Switch the maximum out put current of the CAPSTAN Motor
84	P33	CENT_LED	OUT	Output terminal for center LED control.
85	P32	CAP_HI-H	OUT	Output terminal for capstan speed high.
86	SV1	SV1	OUT	Not used.

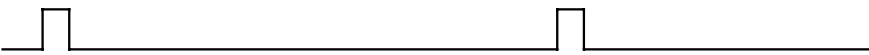
IC DESCRIPTIONS


OEC0090A (IC1001)

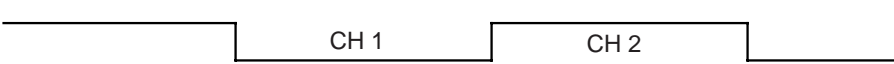
No.	PORT	PIN NAME	I/O	DESCRIPTION
87	SV2	SV2	OUT	Not used.
88	P70	REC/EE/PB	OUT	Recording/Playback switch Head Amp.
89	P71	YC_DOC/XO_CTL	OUT	Set to XO mode or not at EE.Make effective the DOC or not at VV.
90	P72	V.REC.START-H	OUT	Output terminal for REC signal when record.
91	P73	SP-L/LP-M/EP-H	OUT	Valuse speed output Playback/Recording.
92	P74	AUDIO_MUTE-H	OUT	Mute signal of Audio mute.
93	P75	AUDIO_OUT_MUTE-L	OUT	L for at AUDIO MUTE and POWER OFF.H for except above case.
94	P76	INPUT_SEL	OUT	Control the Audio/Video input signal.
95	P77	EE-H	OUT	Output terminal for select Playback/Recording at the circuit of sound.
96	P80	TV/VCR-H	OUT	Output terminal of switch selector TV/VCR.
97	P81	TUNER-L	OUT	Output low at tuner and output high at external input/play.
98	P82	VIDEO_MUTE-H	OUT	Mute signal of Video mute.
99	C.ROT	C.ROTARY	OUT	Color Rotary Control output.
100	H.AMP.SW	H.AMP_SW	OUT	Switching output of Head Amp SW.
101	COMP	COMP	IN	Comparison results input of Playback Envelope level on SP/LP Heads (4 Heads).
102	P85	CAP_FULL	OUT	Output the HIGH during the acceleration force of Capstan Motor at SLOW mode.
103	DPG	DPG	IN	Input terminal for DRUM PG signal.
104	DFG	DFG	IN	Input terminal for DRUM FG signal.
105	VIDEO FF	VIDEO_H.SW	OUT	Output terminal of signal Video head switching.
106	AUDIO FF	Hi-Fi_H.SW	OUT	Output terminal of signal HI-FI sound head switching.
107	DRUM PWM	DRUM_PWM	OUT	Output terminal for PWM of Drum Motor.
108	CAP PWM	CAP_PWM	OUT	Output terminal for PWM of Capstan Motor.
109	VPULSE	DUMMY.V.SYNC	OUT	Output terminal of Video Pluse signal.
110	VSS	VSS	—	Ground.
111	C.SYNC	C.SYNC	IN	Input terminal for composite C SYNC.
112	VCC	VCC	—	AT +5V.

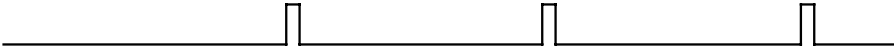
SERVO TIMING CHART

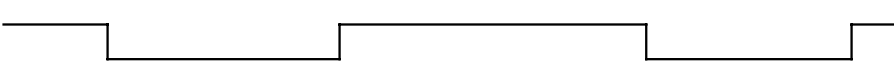
IC1001 (OEC0090A)

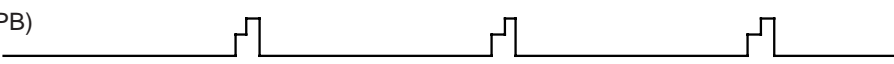
DPG 103 PIN 

DFG 104 PIN 

H. SW. P
105 PIN 

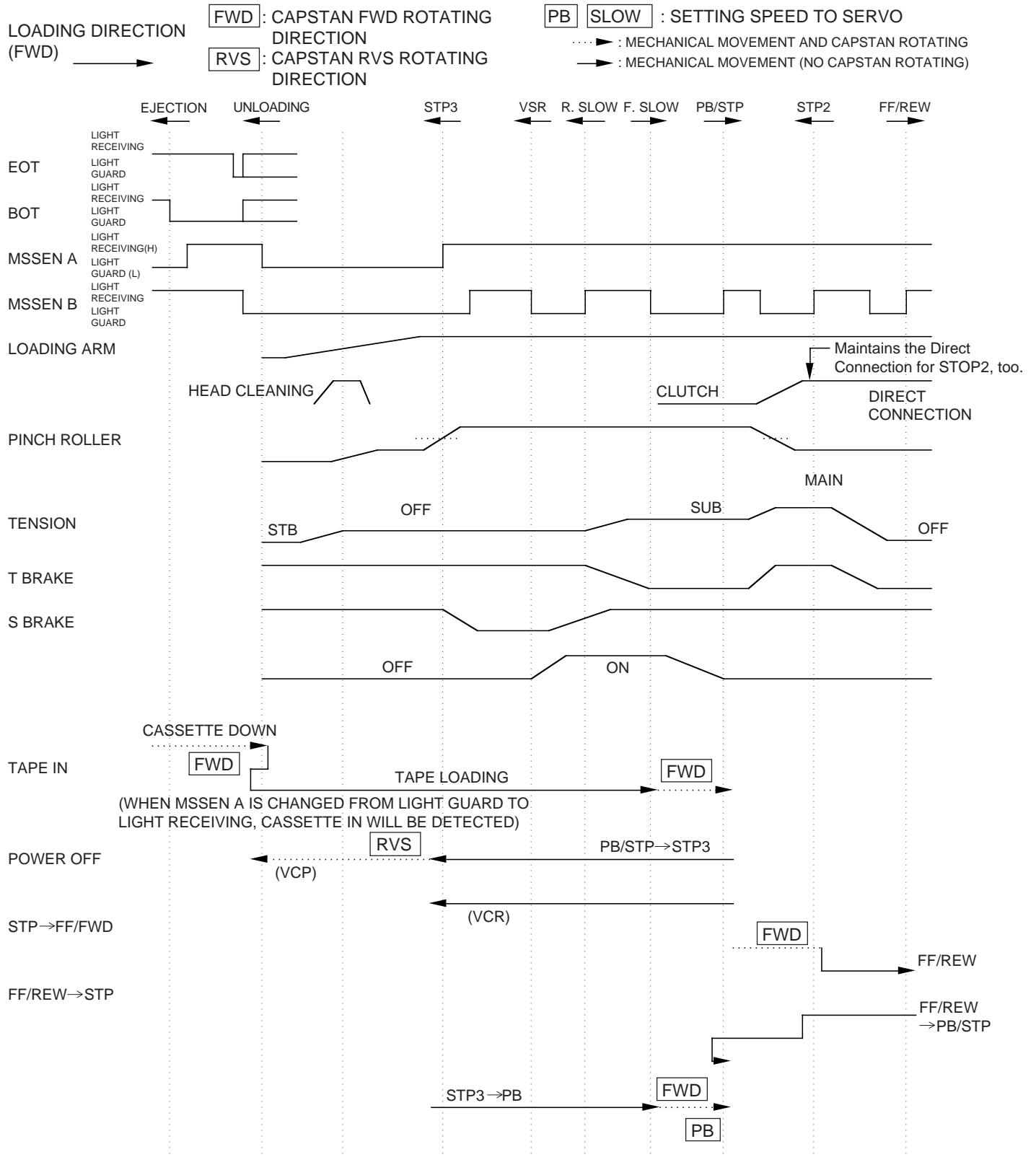
V-SYNC (E-E)
111 PIN 

REC CTL (REC)
7 PIN 

V-SYNC (TRICK PB)
109 PIN 

- WAVEFORM CHANGES DEPENDED ON THE TAPE SPEED

SYSTEM SWITCH MODE



SEMICONDUCTOR BASE CONNECTIONS

DIODE



1SS133T-77
MTZJ13B T-77
MTZJ27D T-77
MTZJ33B T-77
MTZJ5.1C T-77
MTZJ5.6C T-77
MTZJ6.8B T-77



1N4005E-G23
21DQ04N-TA2B1
RGP10JE-G3
UG2D-G23



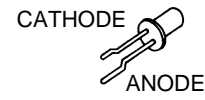
TMPG06-12A-G3



1SS244T-77



SID1050CM

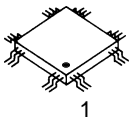


SLZ-345B-02-T1

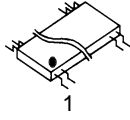


ENE271D-10A

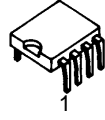
IC



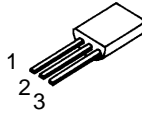
64PIN
AN3662FBP



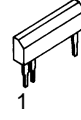
32PIN
BU2977FS



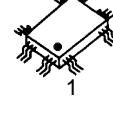
8PIN
S-24C08ADPA-01



3PIN
KIA431
RE5VS31A



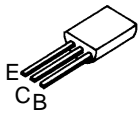
8PIN
BA6955AN



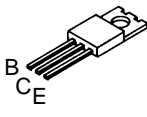
100PIN
LA71067M-MPB
112PIN
OEC0090A

SEMICONDUCTOR BASE CONNECTIONS

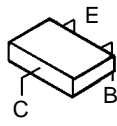
TRANSISTOR



2SA1015Y(TPE2)
2SA1318(S,T)-AA
2SC1815Y(TPE2)
2SC3331(S,T,U)-A
2SD1246(S,T)-AA
2SD734(E,F)-AA



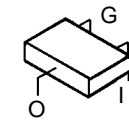
2SC4160-OEC-YAC



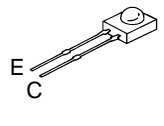
2SC2412KT146



R,ξ TLP621(D4-GR-LF2 RPI-352Q01R



DTA114EKAT146
DTA124EKAT146
DTC124EKAT146

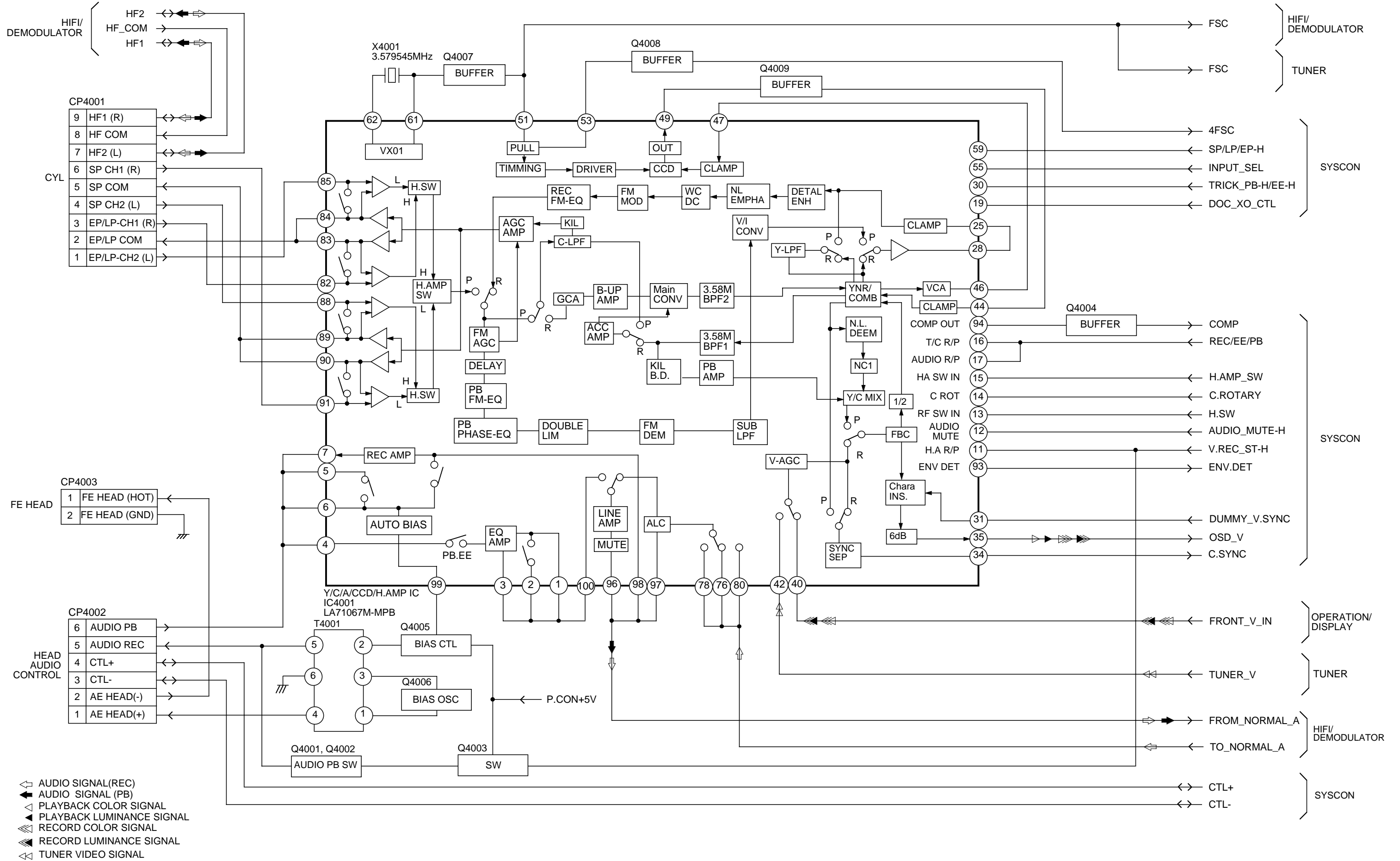


PNA2604M010R

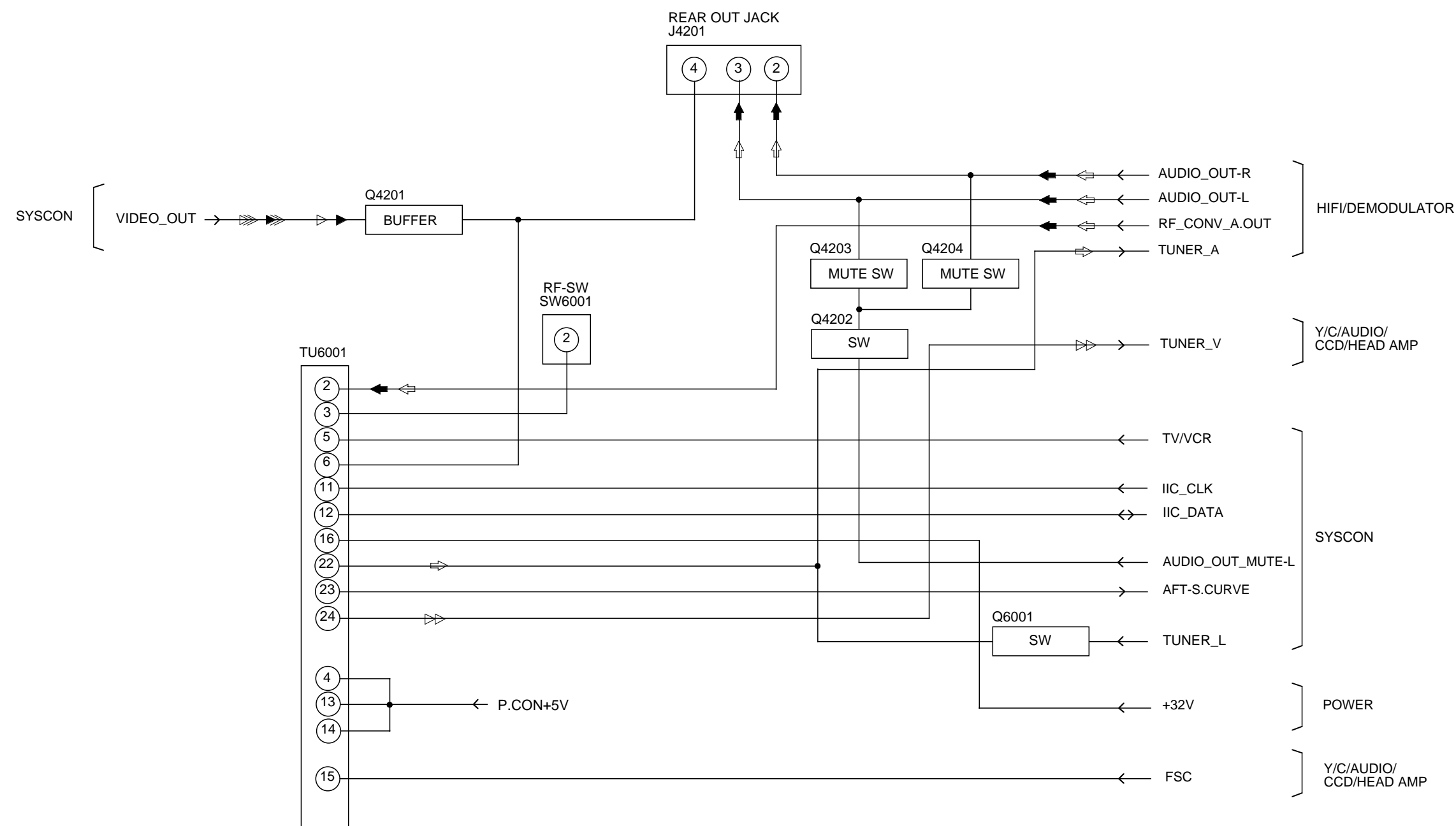


SG-260

Y/C/AUDIO/CCD/HEAD AMP BLOCK DIAGRAM

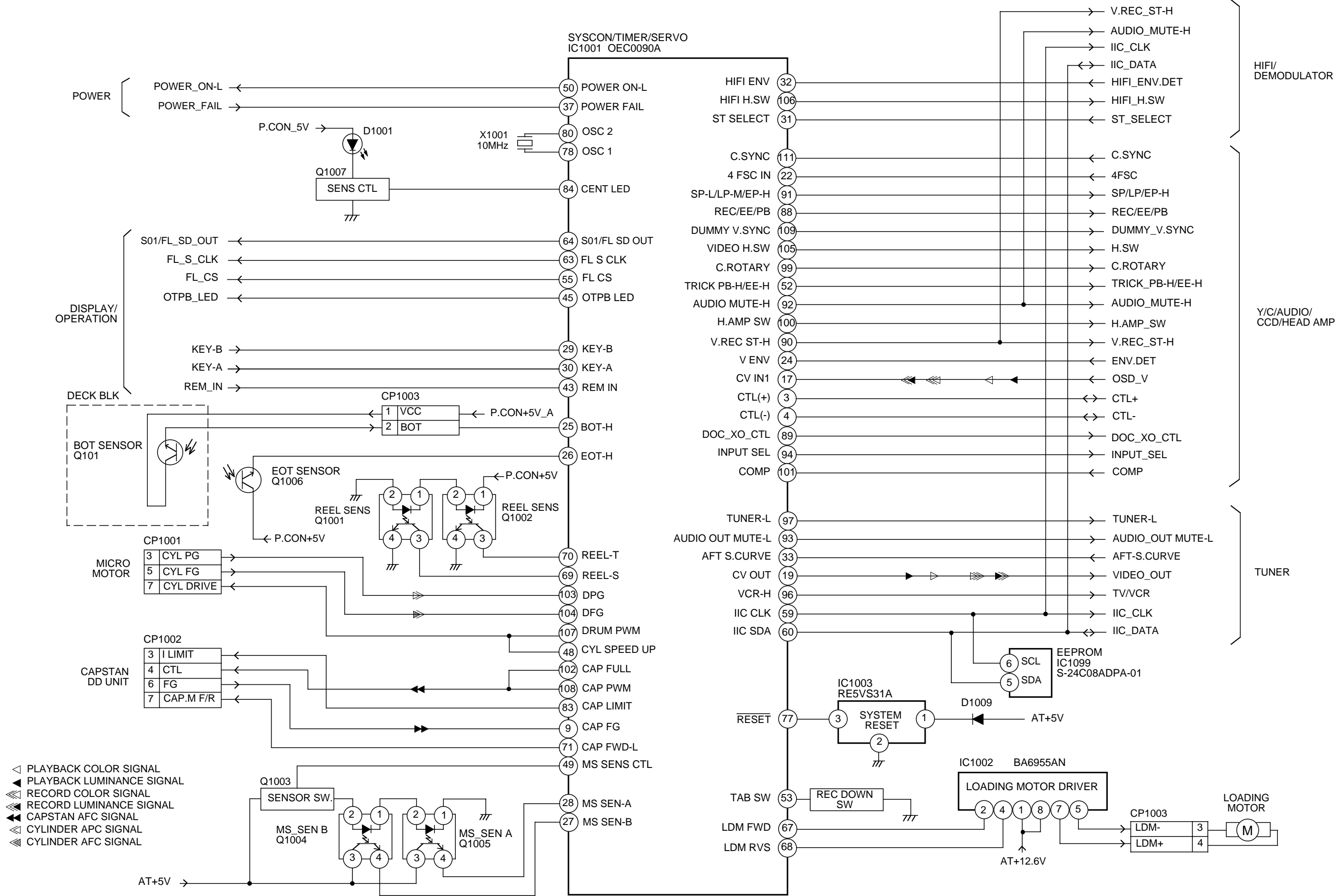


TUNER BLOCK DIAGRAM

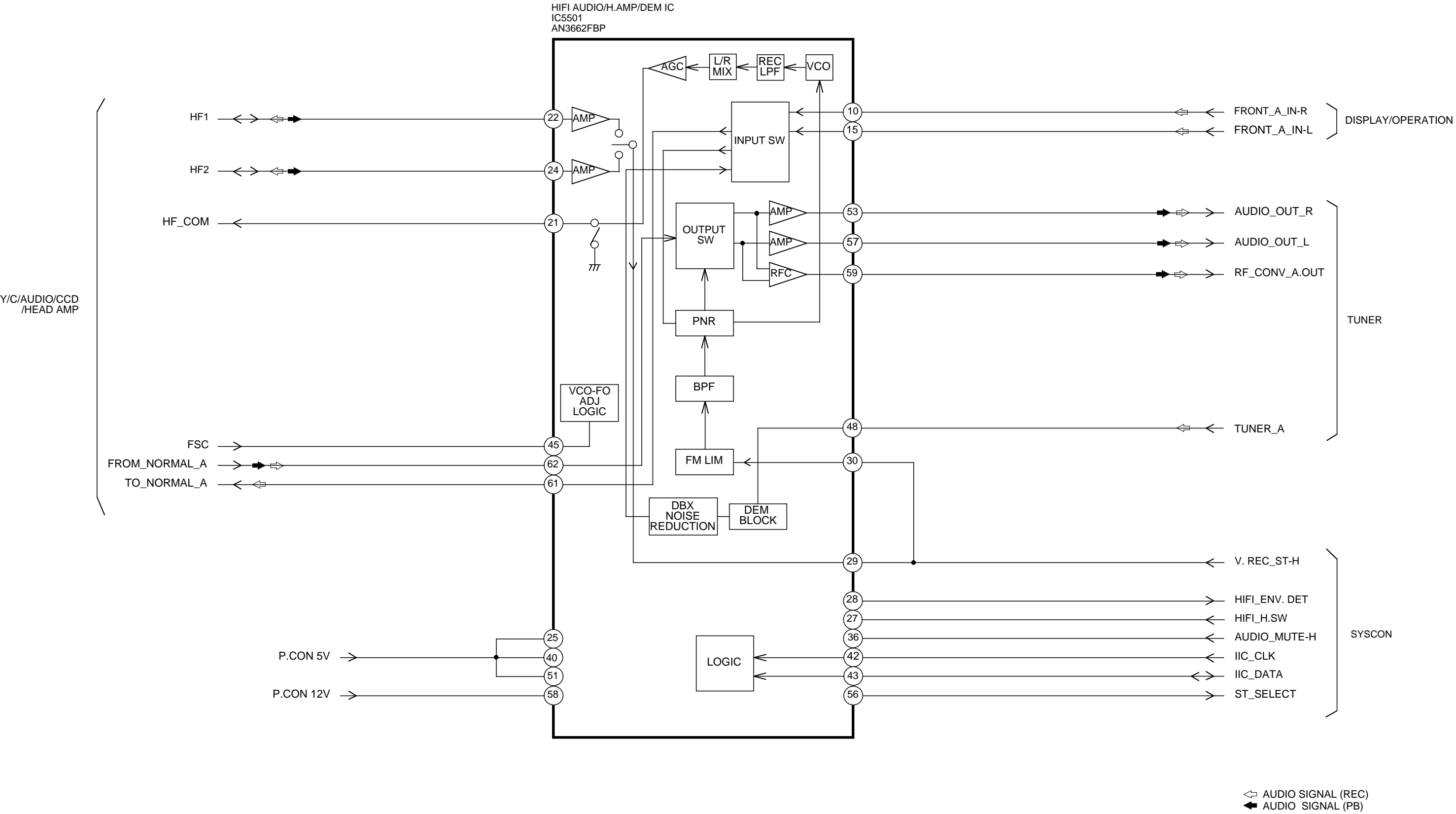


- ◁ AUDIO SIGNAL(REC)
- ◀ AUDIO SIGNAL(PB)
- ▷ PLAYBACK COLOR SIGNAL
- ▶ PLAYBACK LUMINANCE SIGNAL
- ◁◁ RECORD COLOR SIGNAL
- ◁ RECORD LUMINANCE SIGNAL
- ▷▷ TUNER VIDEO SIGNAL

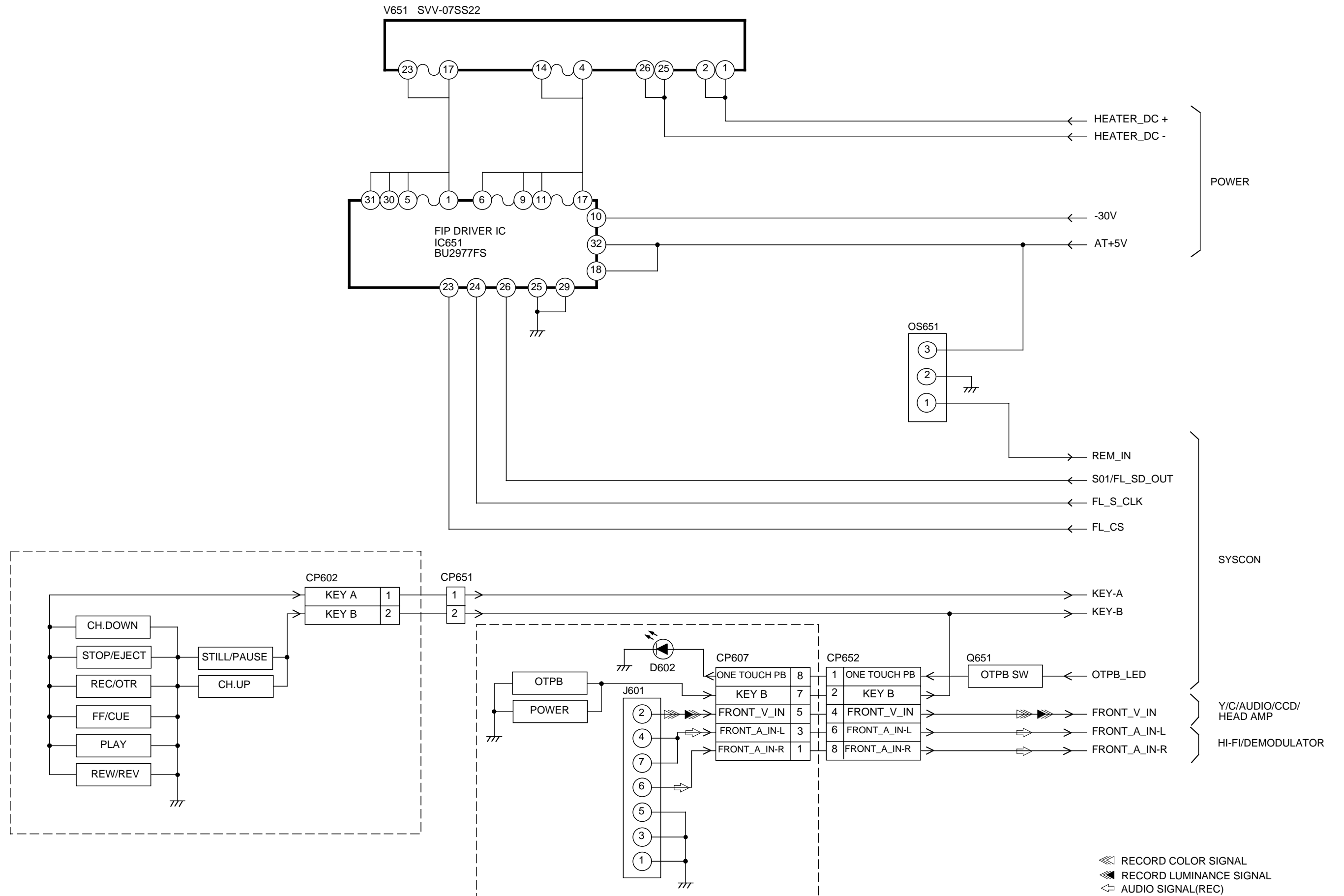
SYSTEM CONTROL BLOCK DIAGRAM



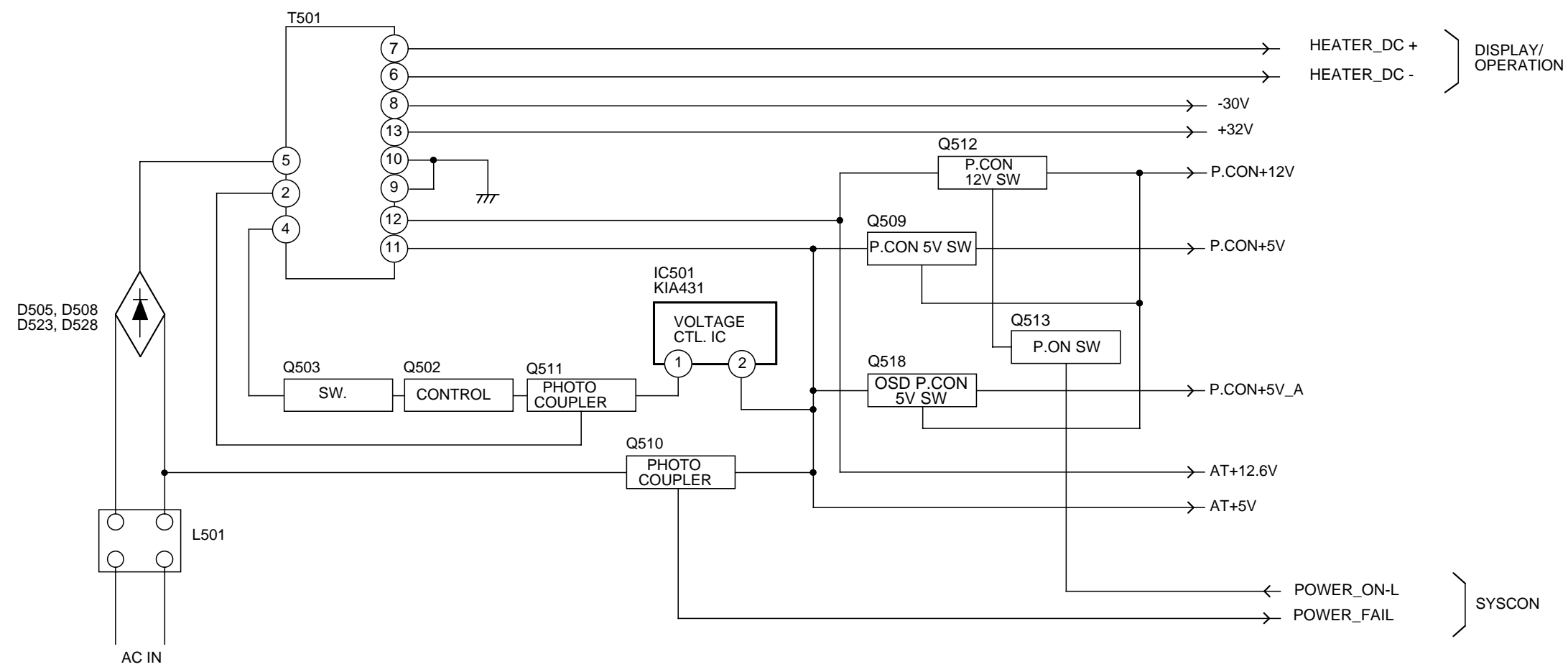
HIFI/DEMODULATOR BLOCK DIAGRAM



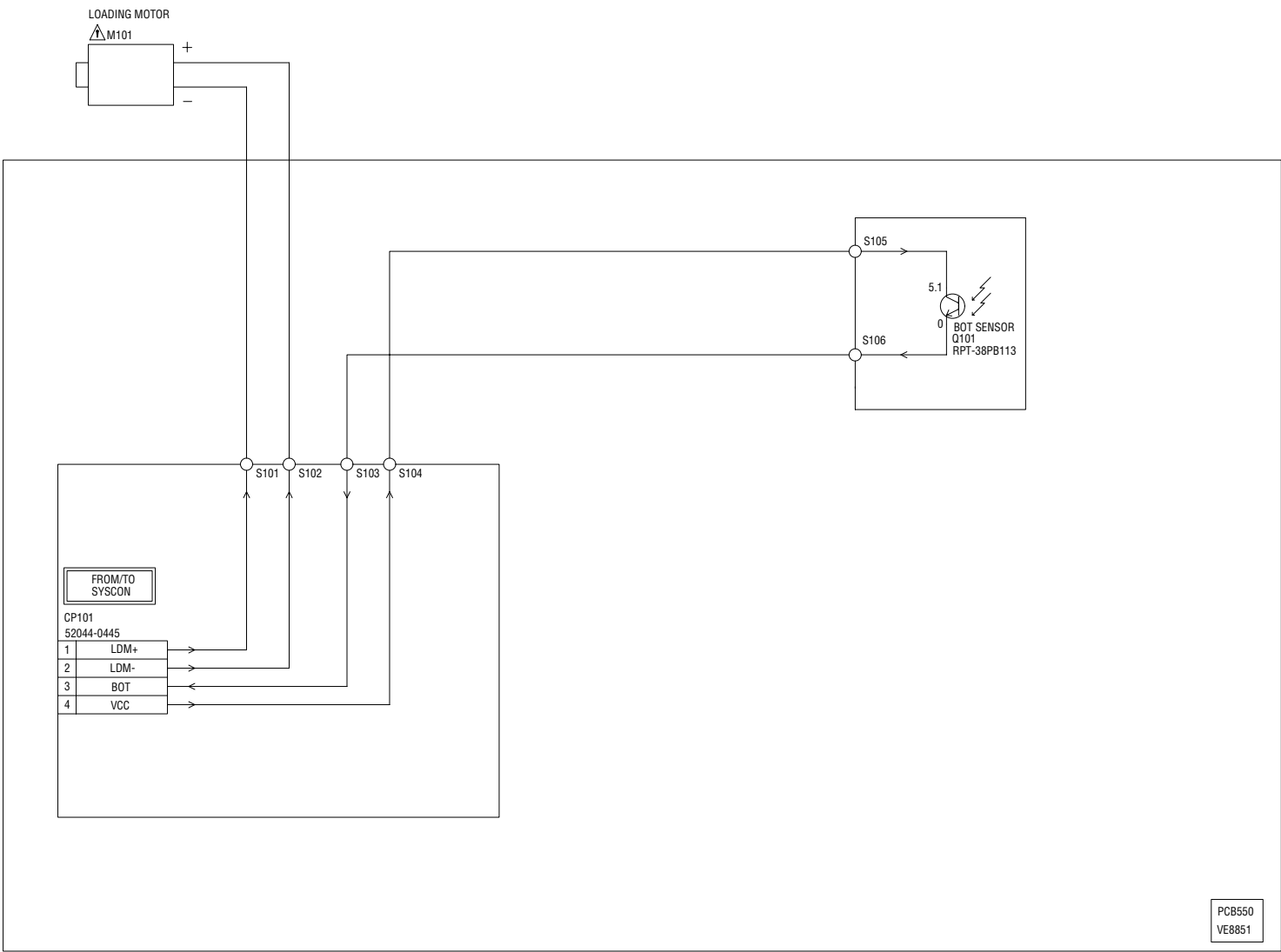
DISPLAY/OPERATION BLOCK DIAGRAM





POWER BLOCK DIAGRAM



DECK SCHEMATIC DIAGRAM
(DECK PCB)



CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

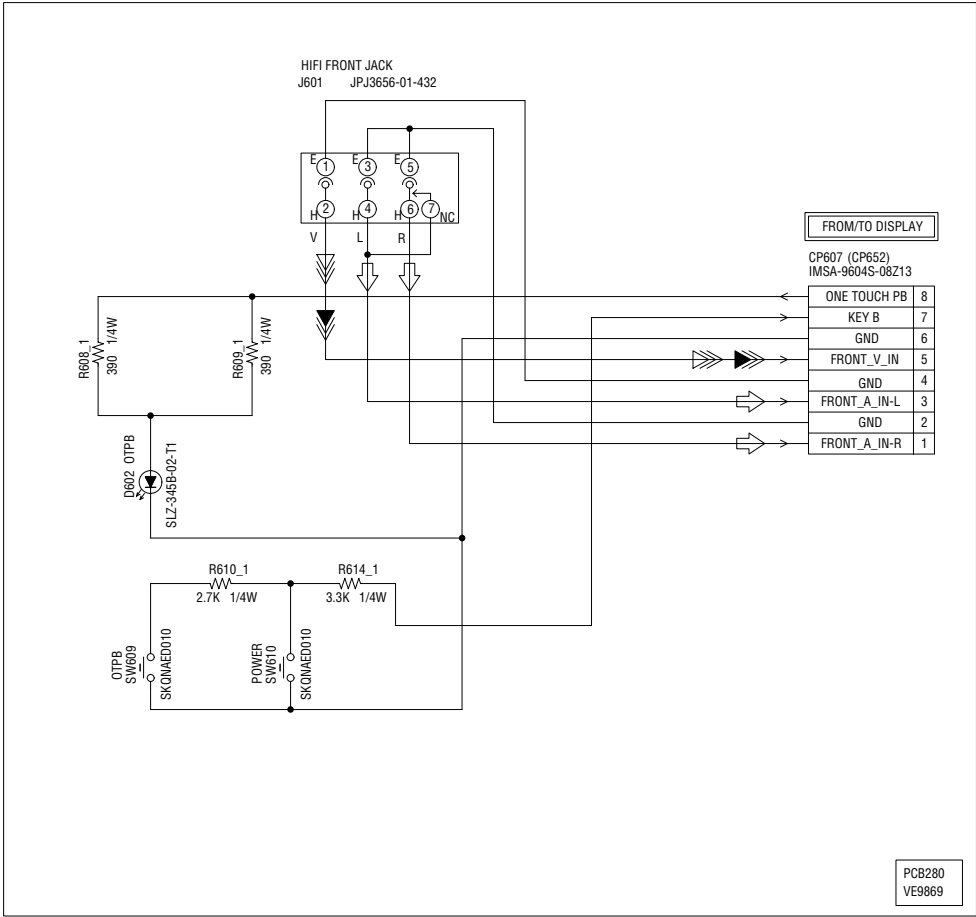
ATTENTION: LES PIECES REPARÉES PAR UN  ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

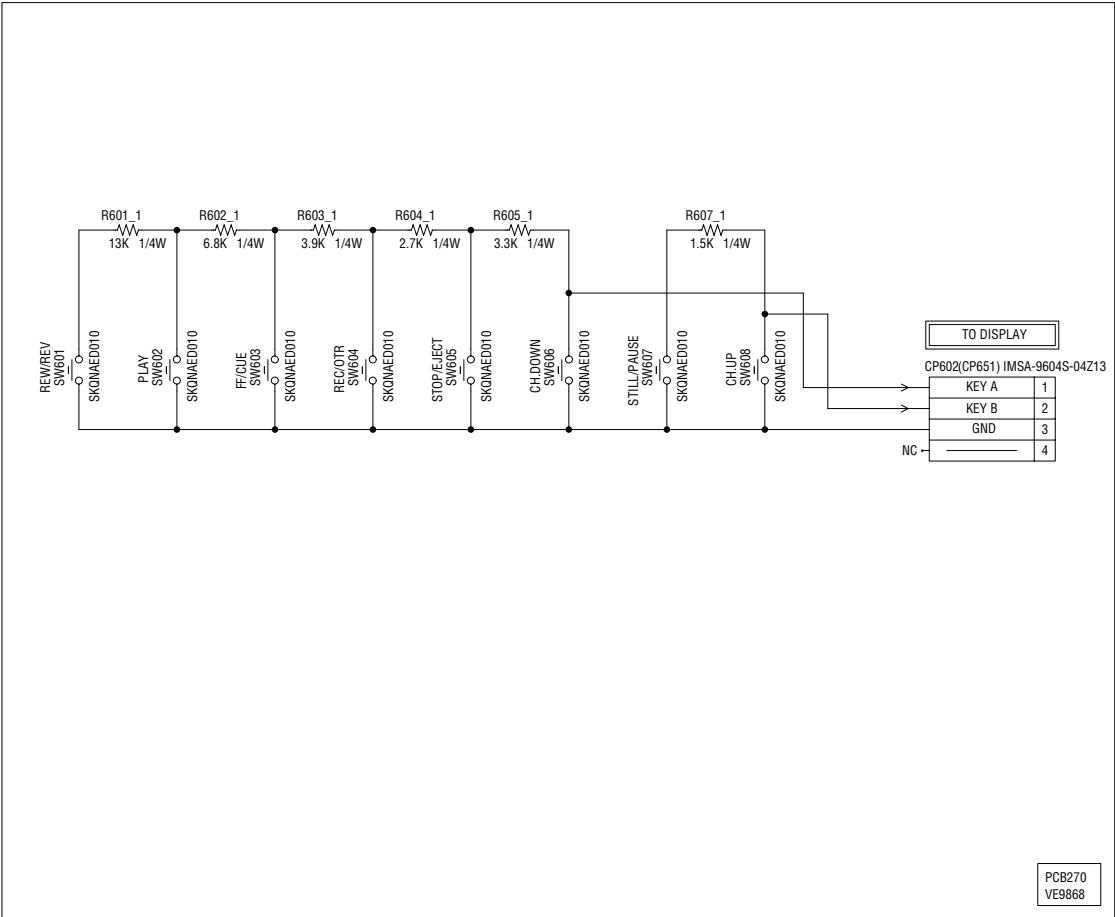
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

OPERATION SCHEMATIC DIAGRAM

(OPERATION 2 PCB)



(OPERATION 1 PCB)

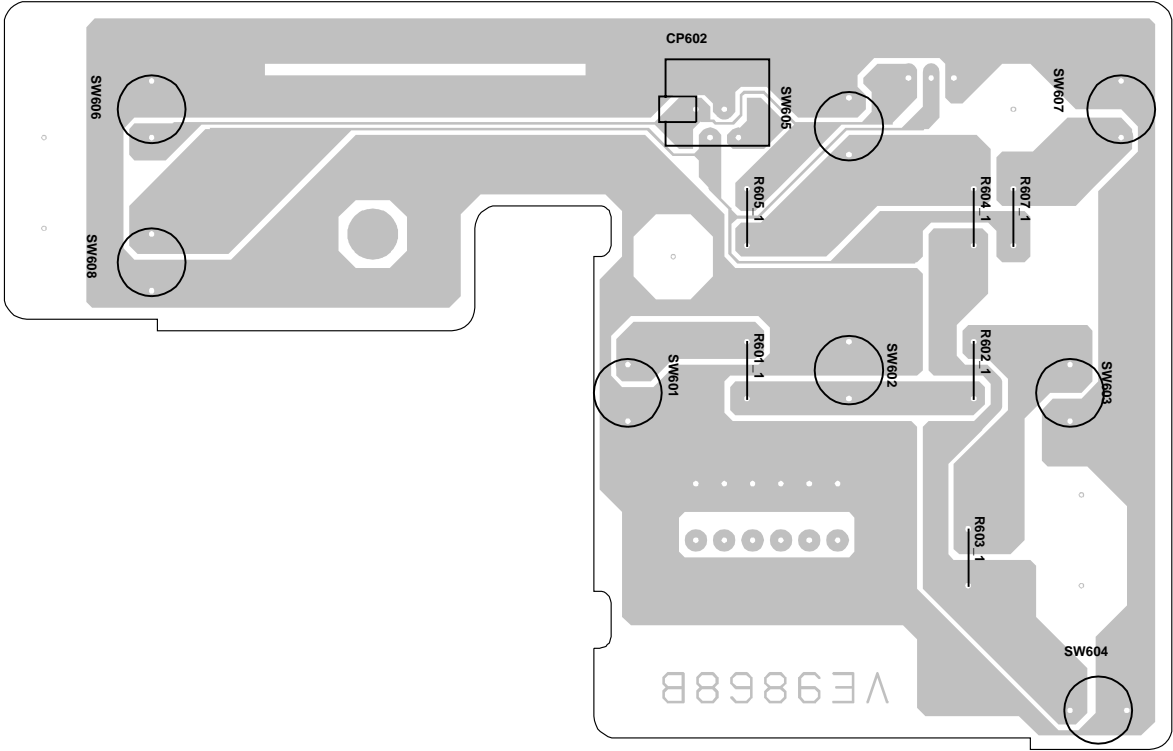


◀ RECORD LUMINANCE SIGNAL
◀ RECORD COLOR SIGNAL
◀ AUDIO SIGNAL(REC)

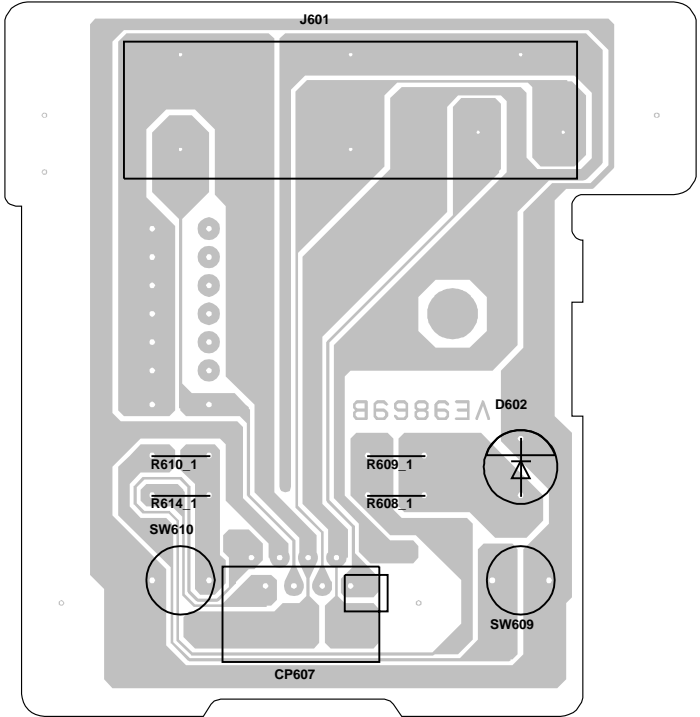
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

PRINTED CIRCUIT BOARDS

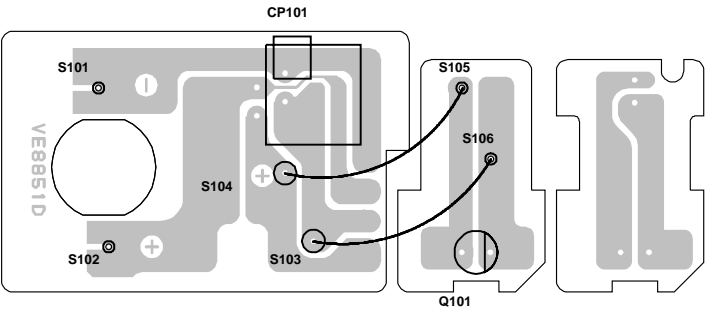
OPERATION1
SOLDER SIDE



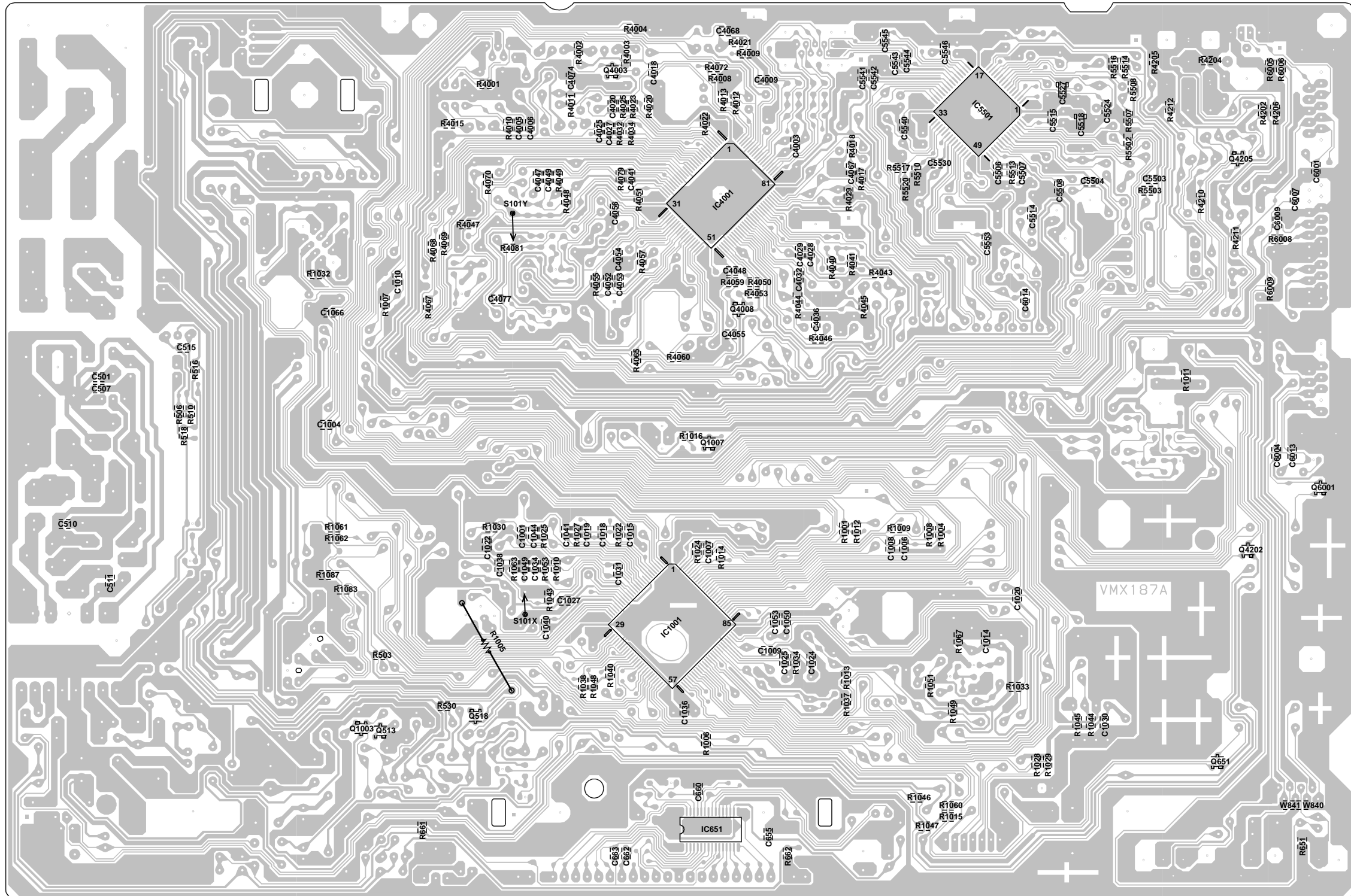
OPERATION2
SOLDER SIDE



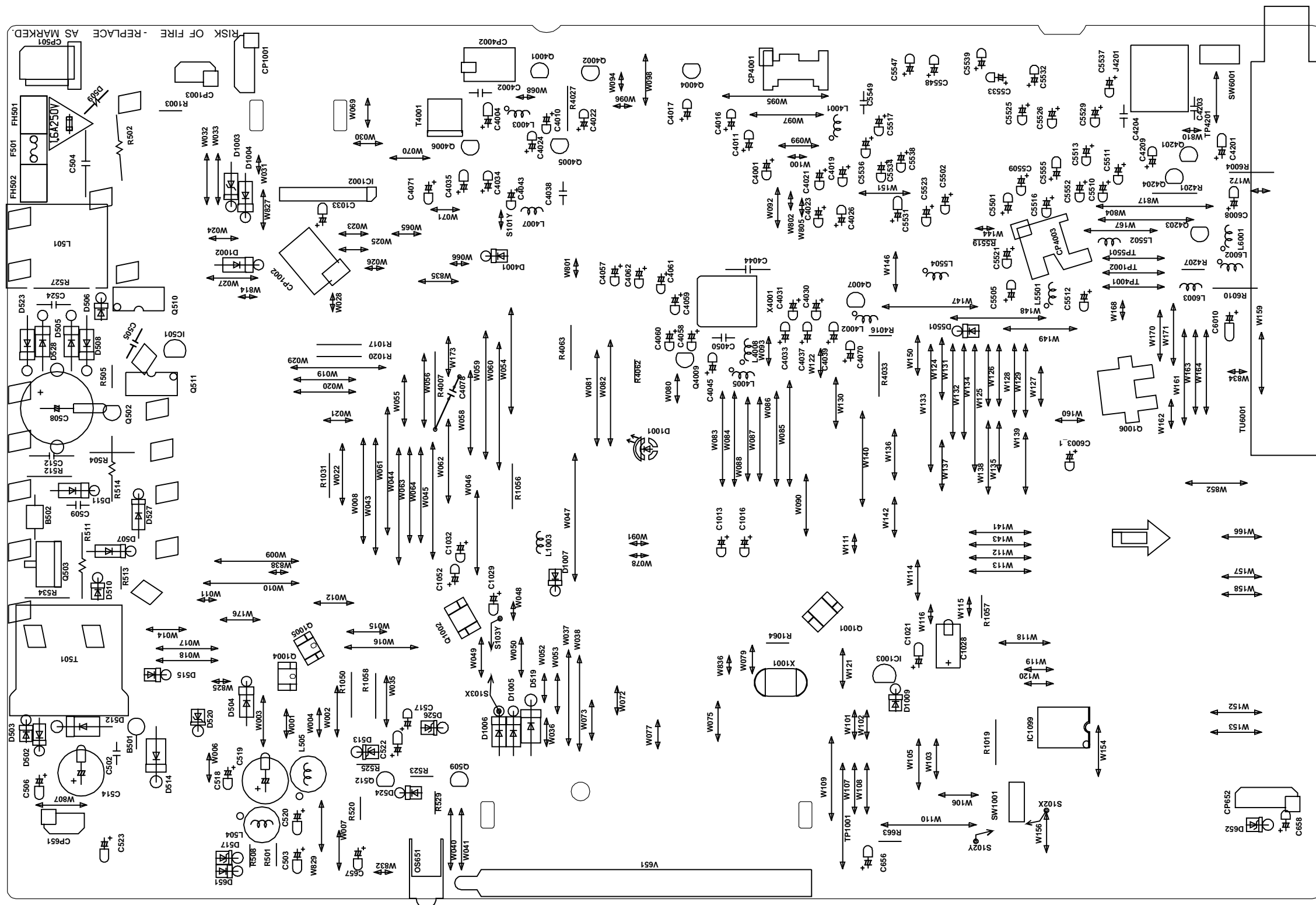
DECK
SOLDER SIDE



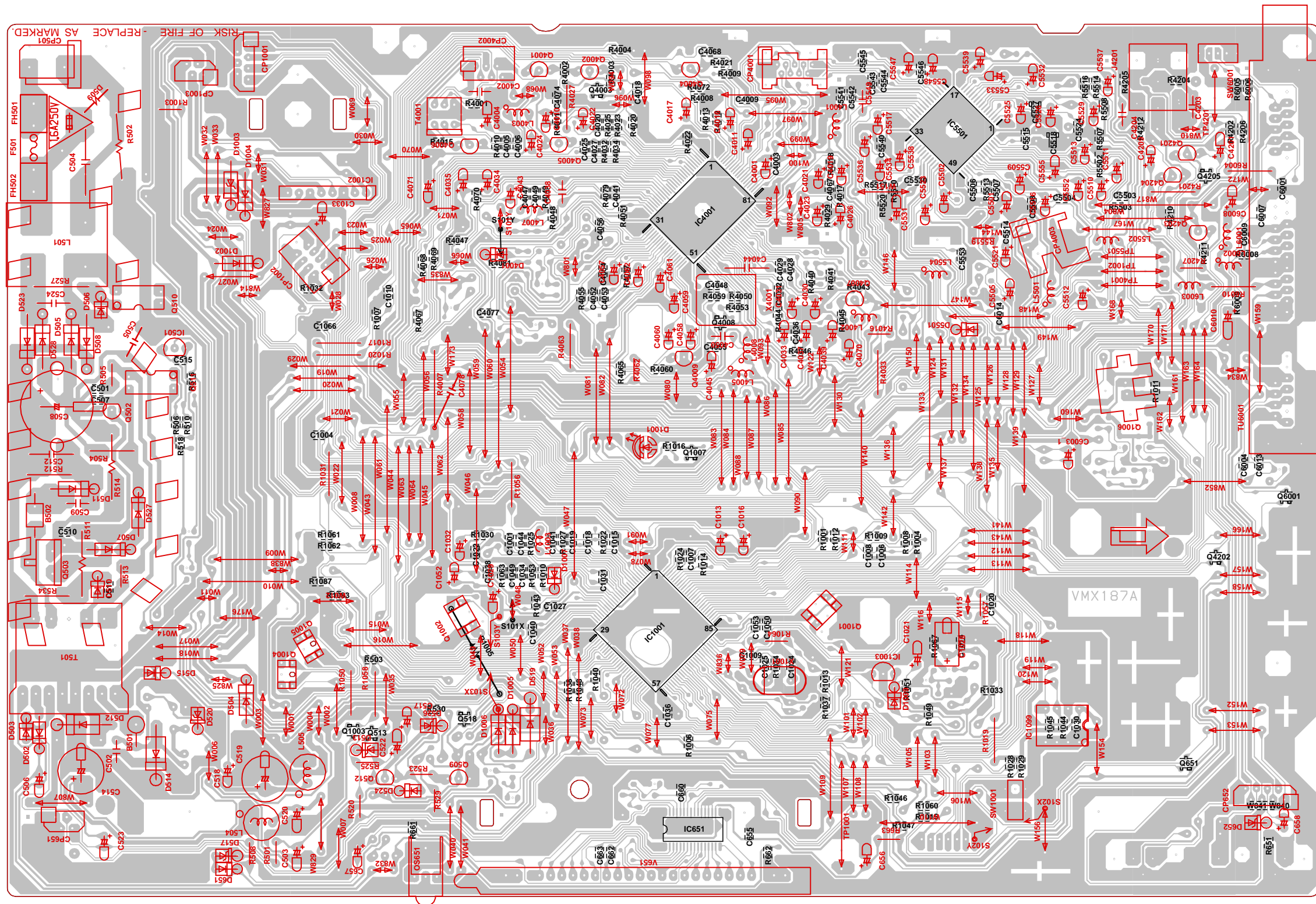
PRINTED CIRCUIT BOARDS SYSCON



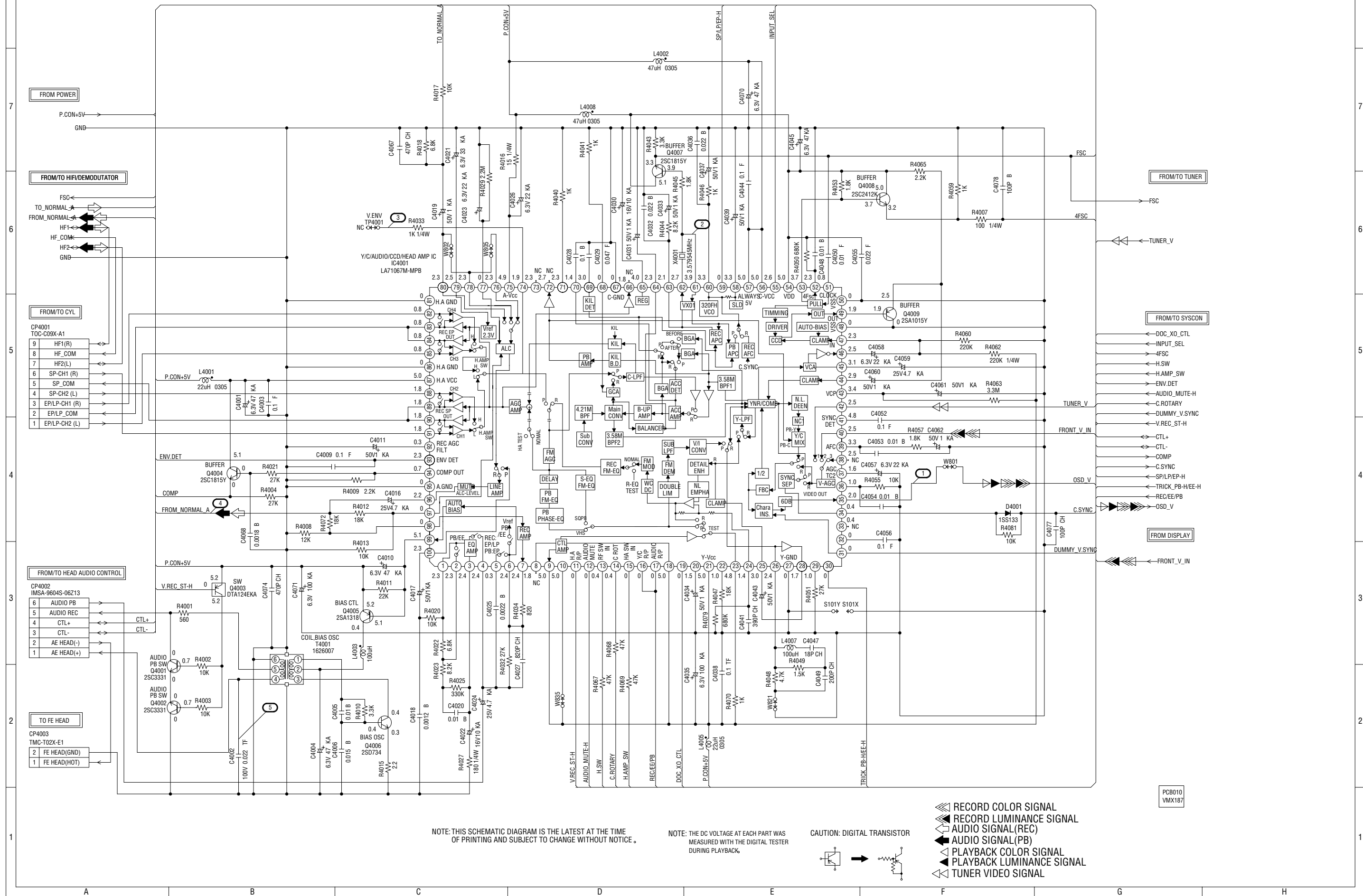
PRINTED CIRCUIT BOARDS SYSCON



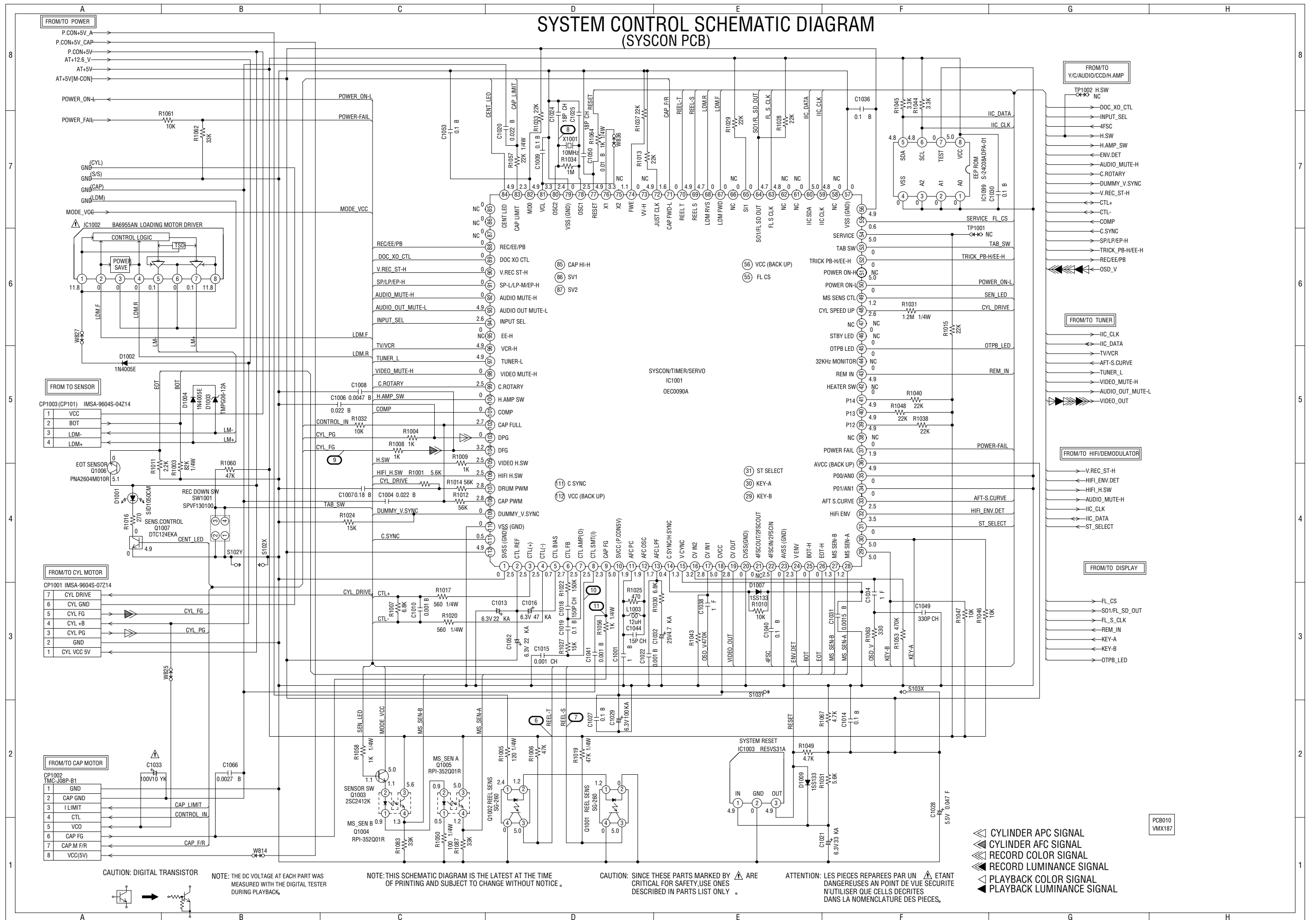
PRINTED CIRCUIT BOARDS SYSCON



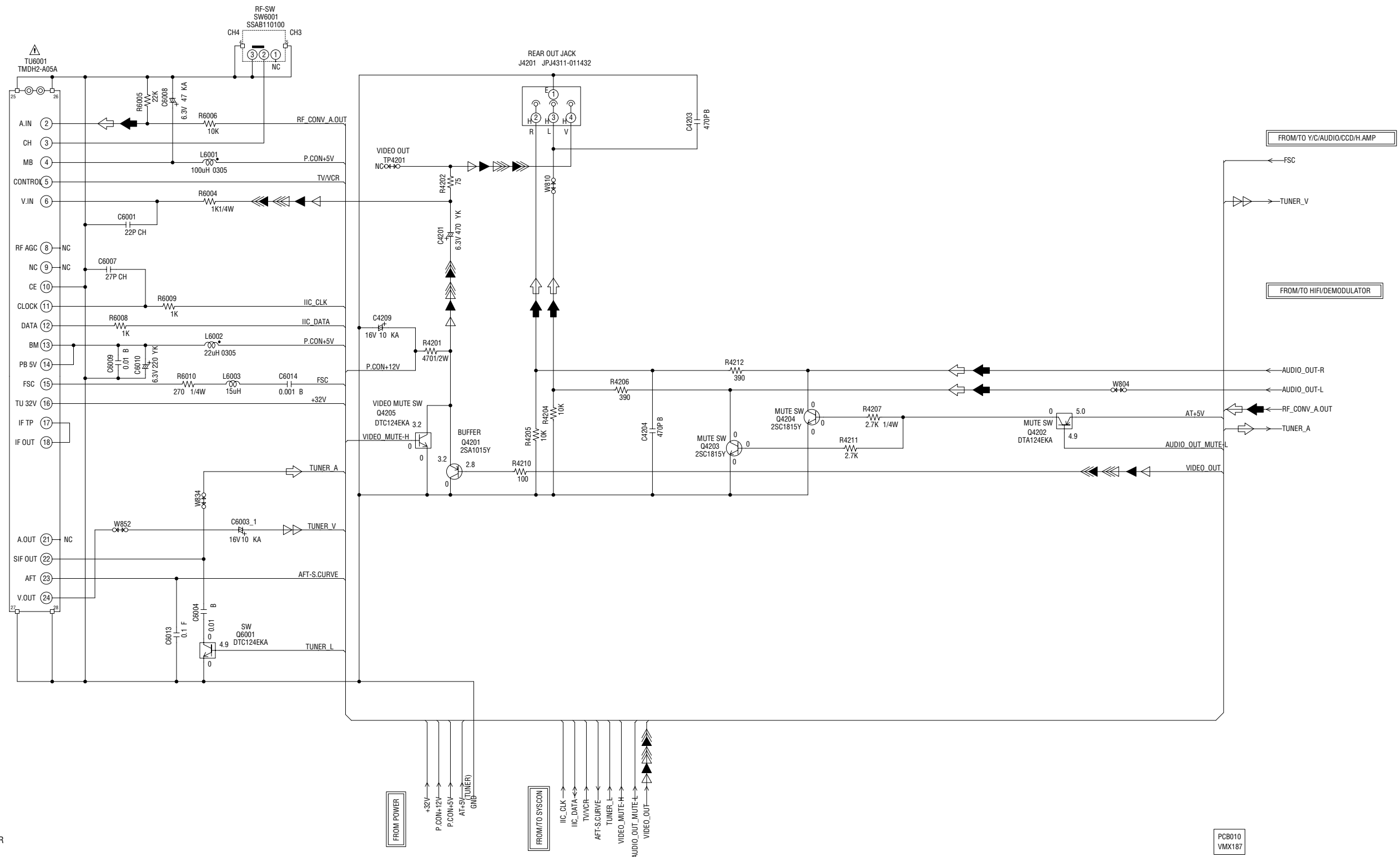
Y/C/AUDIO/CCD/HEAD AMP SCHEMATIC DIAGRAM (SYSCON PCB)



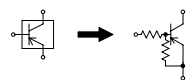
SYSTEM CONTROL SCHEMATIC DIAGRAM (SYSCON PCB)



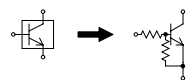
TUNER SCHEMATIC DIAGRAM (SYSCON PCB)



CAUTION: DIGITAL TRANSISTOR



CAUTION: DIGITAL TRANSISTOR



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

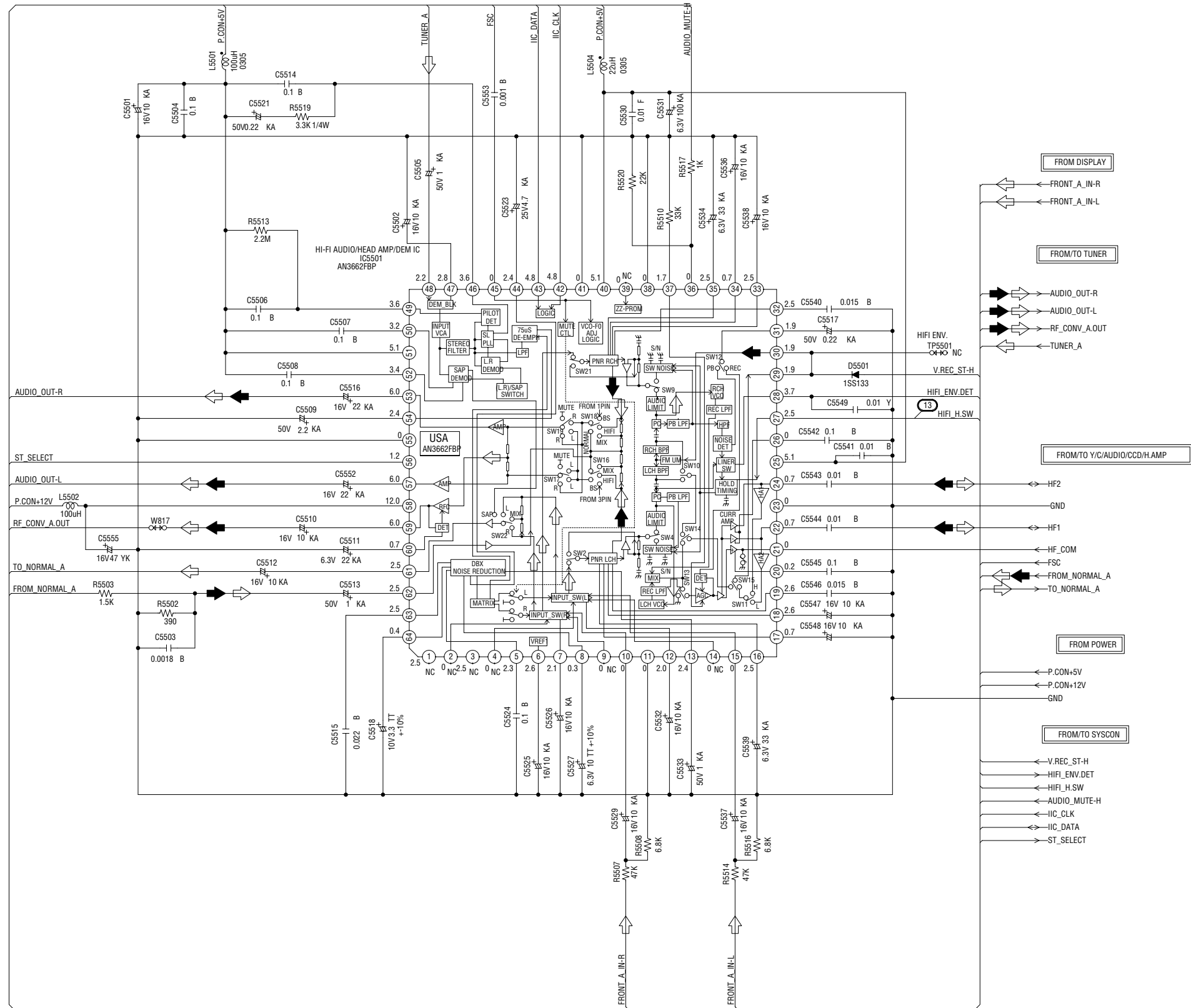
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

◀ PLAYBACK LUMINANCE SIGNAL ◀◀ RECORD LUMINANCE SIGNAL
 ◁ PLAYBACK COLOR SIGNAL ◁◁ RECORD COLOR SIGNAL
 ⇐ AUDIO SIGNAL(REC)
 ⇐ AUDIO SIGNAL(PB)
 ◁◁ TUNER VIDEO SIGNAL

PCB010
VMX187

HIFI/DEMODULATOR SCHEMATIC DIAGRAM
(SYSCON PCB)



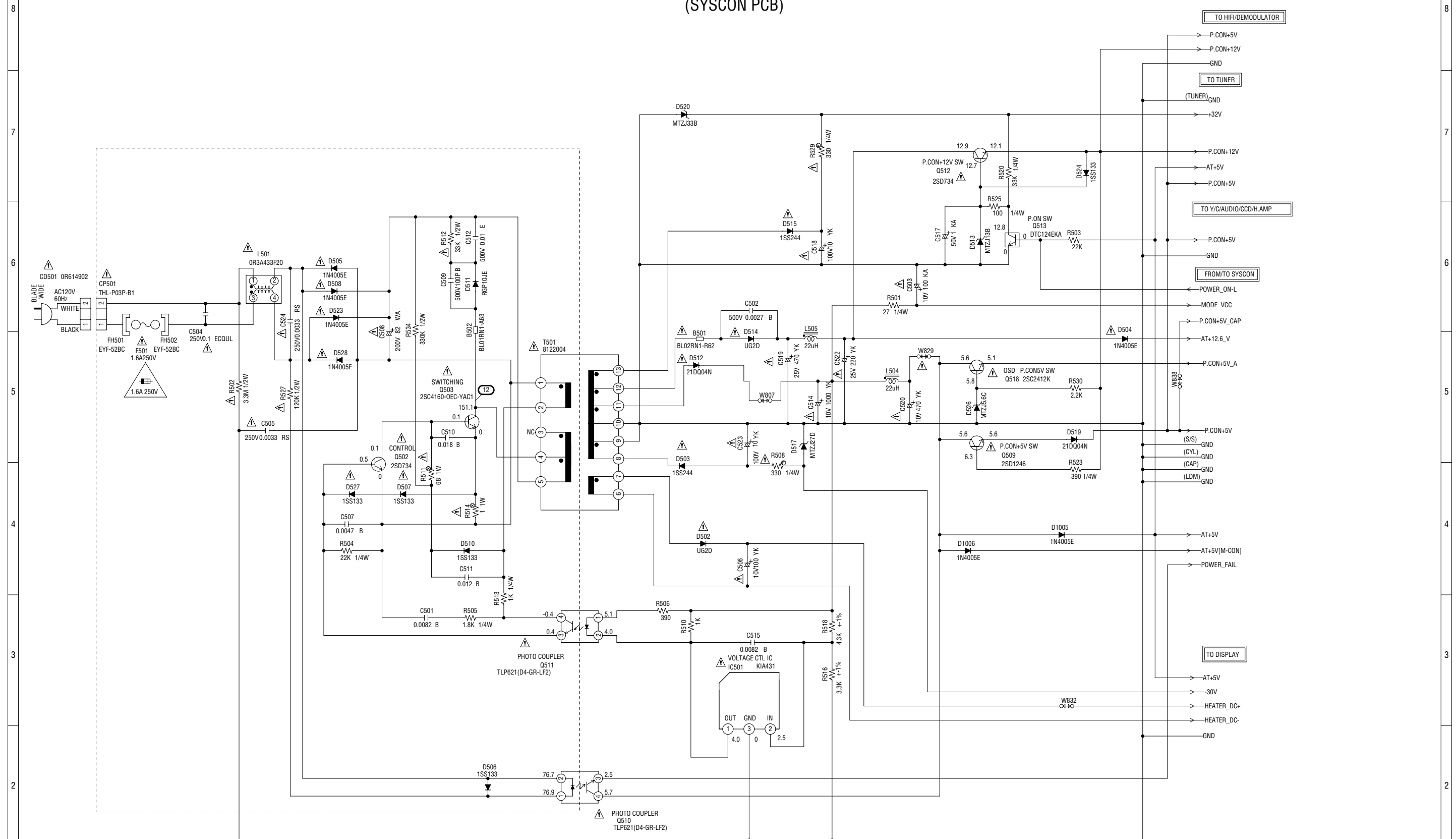
NOTE: THE DC VOLTAGE AT EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

◁ AUDIO SIGNAL(REC)
◀ AUDIO SIGNAL(PB)

PCB010
VMX187

POWER SCHEMATIC DIAGRAM (SYSCON PCB)




1.6A 250V

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE 1.6A 250V
(F501).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'INCENDIE N'UTILISER QUE DES FUSIBLES DE MEME
TYPE 1.6A 250V (F501).

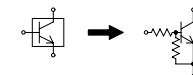
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

CAUTION: DIGITAL TRANSISTOR



PCB010
VMX187



CP652(CP607) IMSA-9604S-08Z14

[illegible]

FROM OPERATION

CP651(CP602)IMSA-9604S-04Z14

Pin	Label	Connection
4	KEY A	KEY-A
3	KEY B	KEY-B
2	GND	Common Ground
1	GND	Common Ground

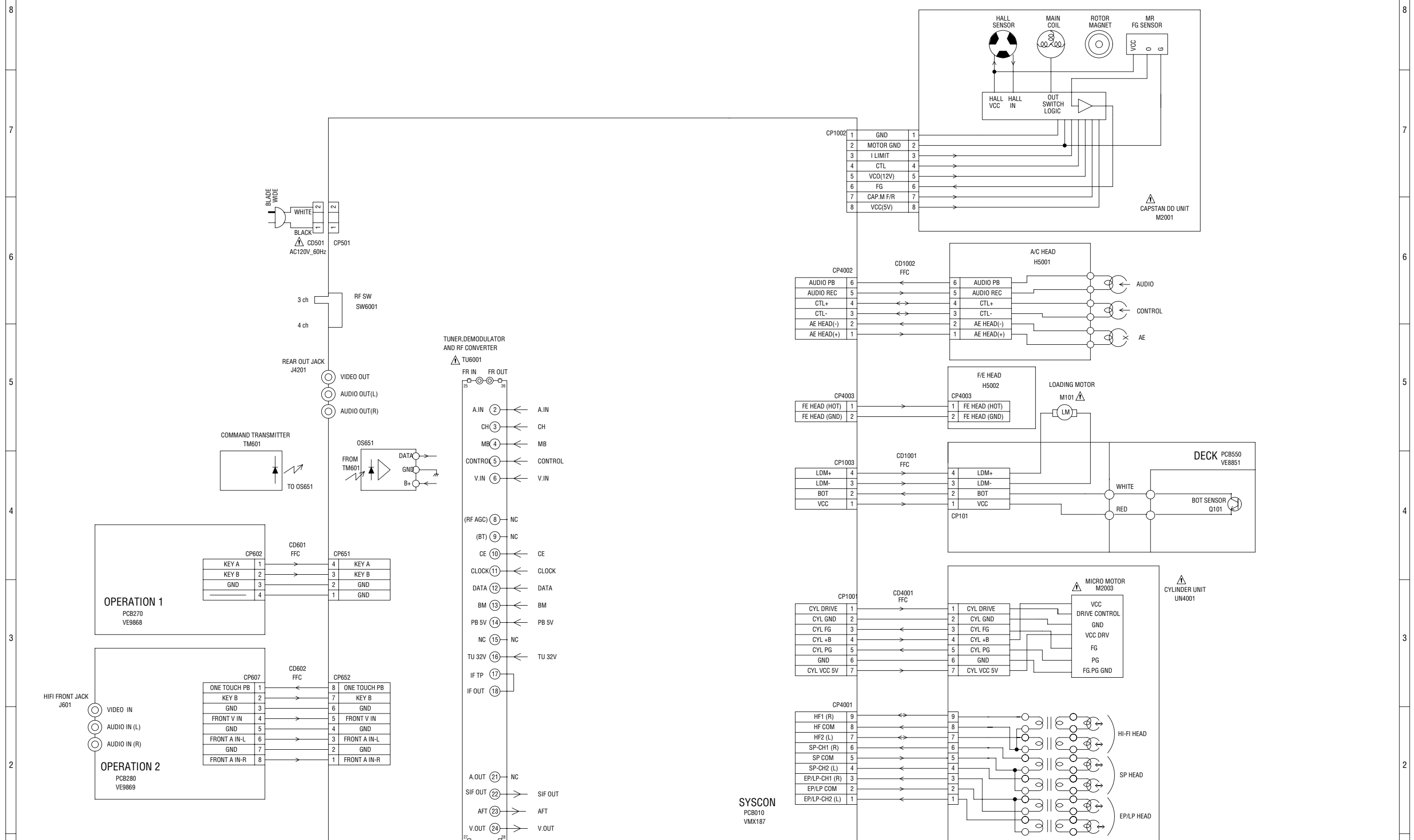
PCB010
VMX187

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

◀◀ RECORD LUMINANCE SIGNAL
 ◀◀ RECORD COLOR SIGNAL
 ◀ AUDIO SIGNAL(REC)

INTERCONNECTION DIAGRAM



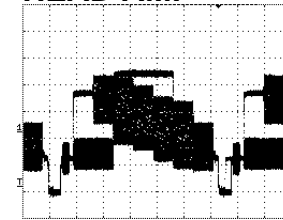
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

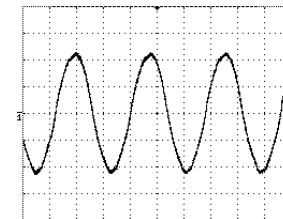
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

WAVEFORMS

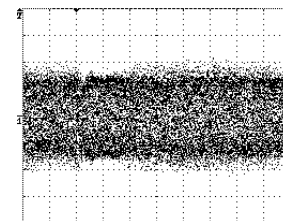
Y/C/AUDIO/CCD/ HEAD AMP



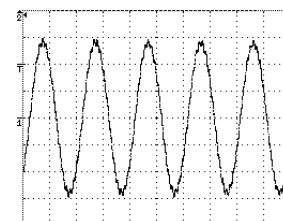
① POWER ON
10µs 500mV/div



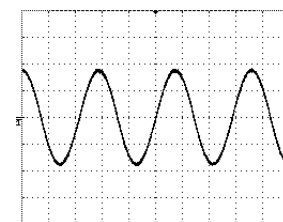
② POWER ON
100ns 100mV/div



③ PB
1ms 100mV/div

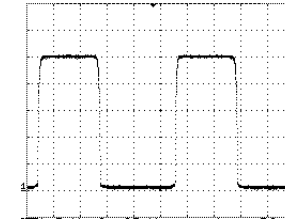


④ PB
500µs 200mV/div



⑤ REC
5µs 20.0V/div

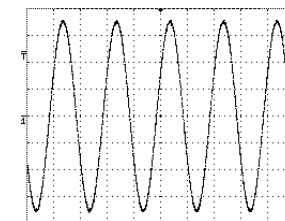
SYSCON



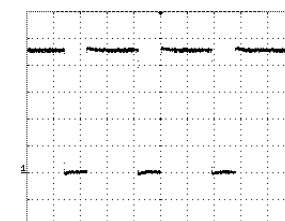
⑥ PB
200ms 1.0V/div



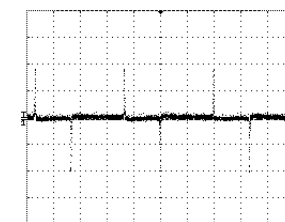
⑦ PB
200ms 1.0V/div



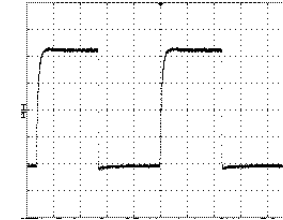
⑧ POWER ON
50ns 500mV/div



⑨ PB
500µs 1.0V/div



⑩ PB
10ms 1.0V/div



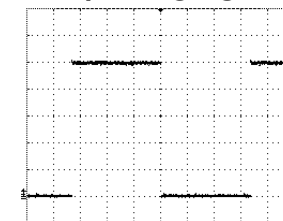
⑪ PB
200µs 1.0V/div

POWER



⑫ PB
2µs 50.0V/div

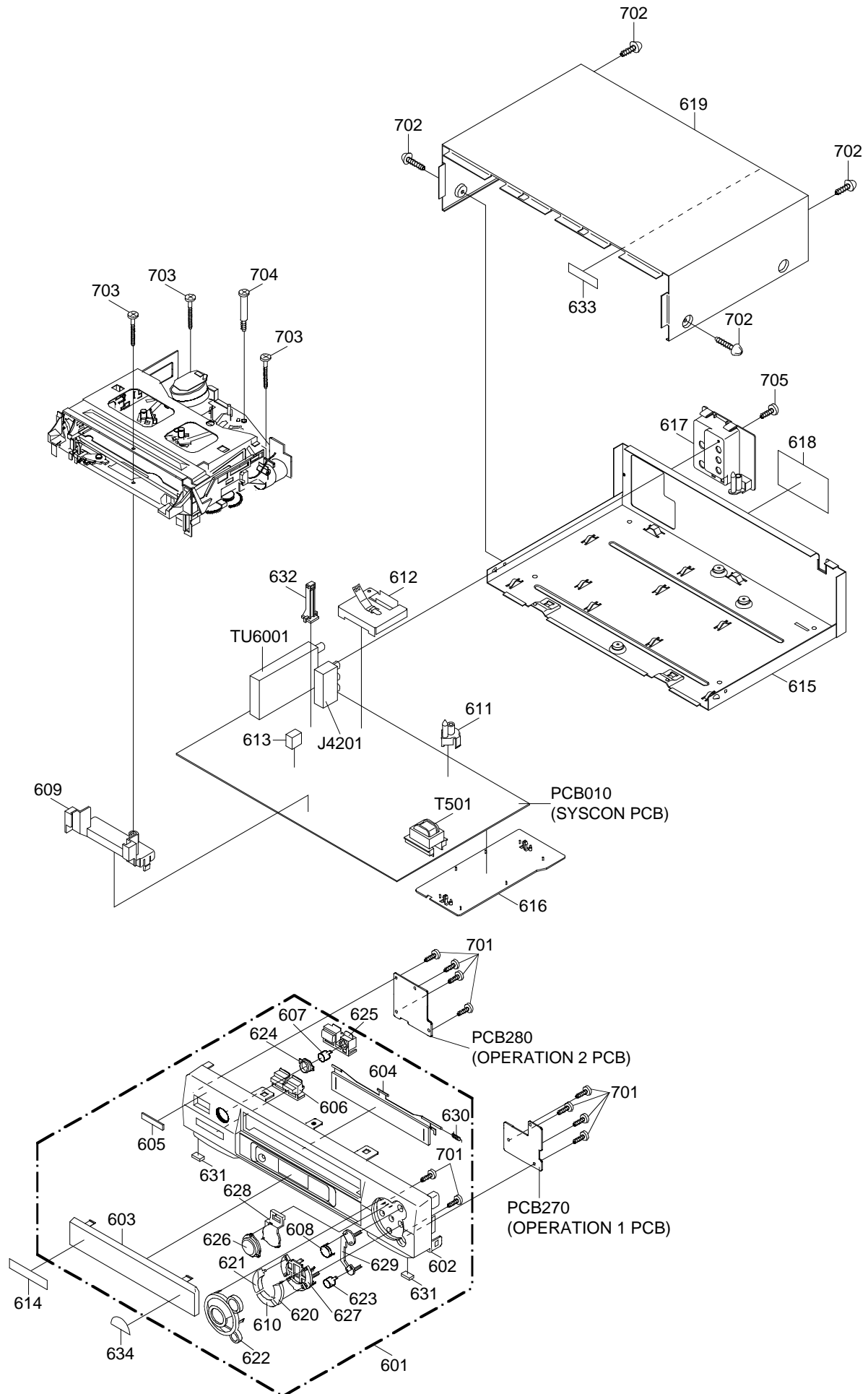
HIFI/DEMODULATOR



⑬ PB
5ms 1.0V/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



MECHANICAL REPLACEMENT PARTS LIST

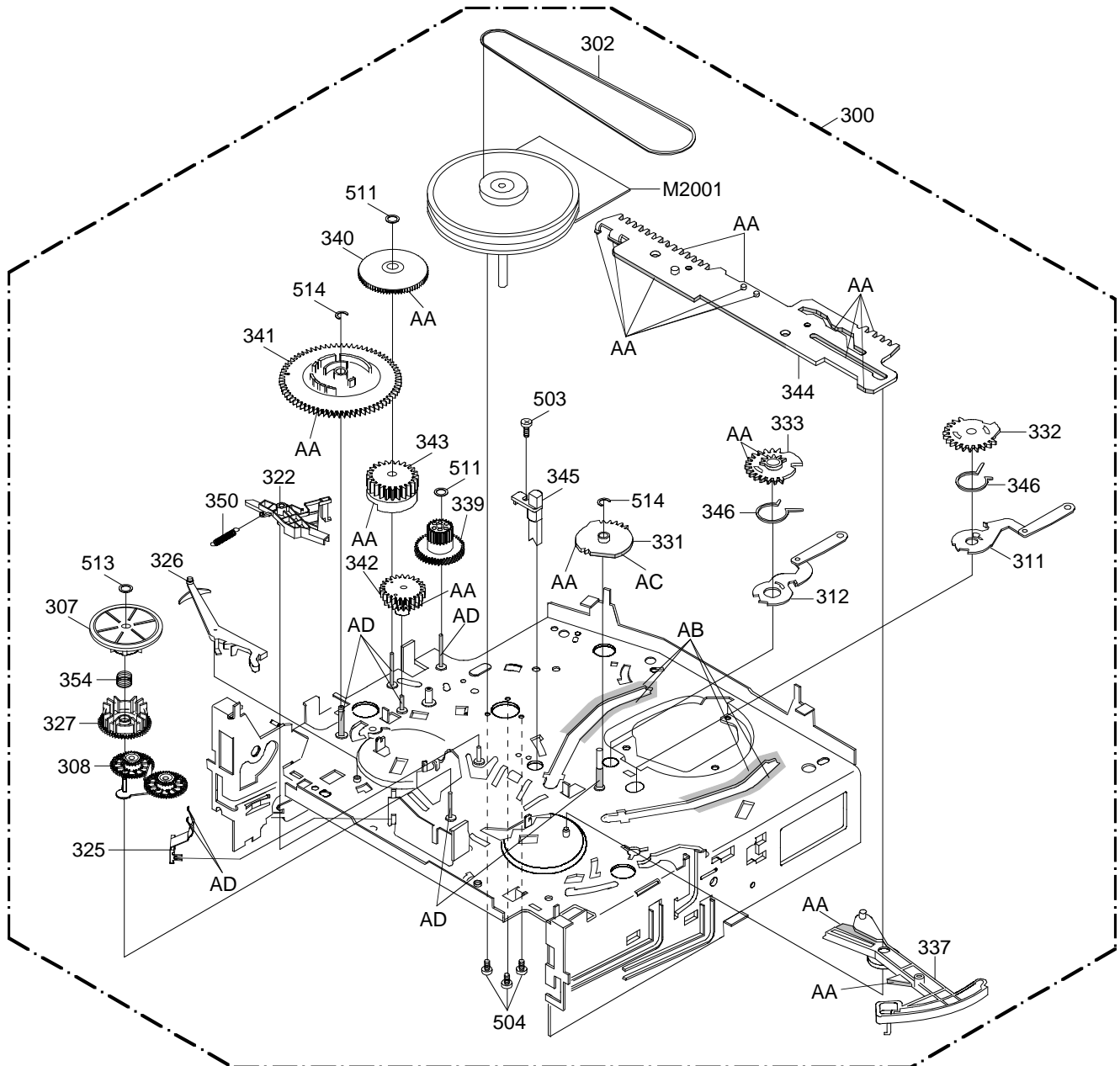
REF. NO.	PART NO.	DESCRIPTION	Q'TY
601	S4-C9A-2B7-200	CABINET,FRONT ASS'Y	1
602	----	CABINET,FRONT	1
603	S1-1WP-D05-790	PLATE,DISPLAY	1
604	S1-2WP-J06-840	FLAP	1
605	S2-344-900-130	BADGE,BRAND	1
606	S3-5WP-D06-960	BUTTON,CHANNEL	1
607	S3-5WP-D06-020	BUTTON,OTPB	1
608	S3-5WP-D06-910	BUTTON,REC	1
609	S0-1WP-A03-420	HOLDER,DECK(FIP)	1
610	S3-5WP-D06-920	BUTTON,STOP/EJECT	1
611	S0-4WP-A00-070	HOLDER,DECK(R)	1
612	----	SHIELD,CASE HEAD AMP ASS'Y	1
613	----	RUBBER,SYS CON 8x15xT17.5	1
614	----	FILM,DECORATION	1
615	----	PLATE,BOTTOM	1
616	----	PLATE,COVER POWER	1
617	S0-2WP-A06-460	PLATE,JACK	1
618	----	SHEET,RATING	1
619	S0-2WS-B00-150	CABINET,TOP	1
620	S3-5WP-D06-930	BUTTON,FF	1
621	S3-5WP-D06-940	BUTTON,REW	1
622	S3-5WP-D06-950	BUTTON,BASE	1
623	S3-5WP-D06-970	BUTTON,PAUSE	1
624	S3-5WP-D06-980	RING,OTPB	1
625	S3-5WP-D06-890	BUTTON,POWER	1
626	S3-5WP-D06-900	BUTTON,PLAY	1
627	S3-8WP-A00-110	HOLDER,BUTTON(1)	1
628	S3-8WP-A00-120	HOLDER,BUTTON(2)	1
629	S3-8WP-A00-130	HOLDER,BUTTON(3)	1
630	S4-3WK-A00-320	SPR,FLAP	1
631	----	CUSHION,LEG	2
632	S5-OP7-000-360	HOLDER,EOT SENSOR	1
633	----	SHEET,COVER	1
634	----	LABEL,ENEY STAR	1
701	S1-102-268-040	SCREW,TAP BIND 2.6-8	10
702	S1-072-408-020	SCREW,TAP BIND 4-8	4
703	S1-071-40B-940	SCREW,TAP(S)PAN 4-29	3
704	87-078-174-010	SCREW TAP TITE(S)BIND 4-6	1
705	S1-102-30A-020	VT2+3-10	1

ACCESSORY REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	Q'TY
1	S6-CQL-050-230	CABLE SI-C108-41	1
2	S6-CNB-A50-040	CORD,RCA PIN 06CNBA5004	1
3	S7-660-DD0-100	TRANSMITTER SBJY0P0012A	1
4	S4-C9A-201-000	INSTRUCTION BOOK	1

NOTE: Applying positions AA, AB, AC, AD and BA for the grease or oil are displayed for this section. Check if the correct grease or oil is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	G-488M	AB
	FL-721	AC
	MG-33	AD
OIL	FL OIL No. 6115	BA

NOTE: Applying positions AA, AB, AC, AD and BA for the grease or oil are displayed for this section. Check if the correct grease or oil is applied for each position.

CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	Q'TY	REF. NO.	PART NO.	DESCRIPTION	Q'TY
300	----	DECK ASS'Y A4C931B420A		360	S5-OP9-006-860	TAPE GUIDE R	1
301	S5-OA5-000-220	AHC ASS'Y	1	361	S5-OP9-007-140	COVER,SENSOR L3	1
302	S5-OP2-002-900	BELT,CAPSTAN (S)	1	362	S5-OP9-006-880	LEVER,FLAP	1
303	S5-OP9-007-100	LEVER,REC	1	363	S5-OP9-006-900	CASS HOLDER	1
304	S5-OP5-000-830	BASE,AC HEAD	1	364	S5-OP6-005-400	DRIVER,WORM	1
305	S5-OP8-003-240	SPR,AC HEAD	1	365	S5-OP9-007-130	LOCKER,R2	1
306	S5-OA0-003-670	MAIN CHASSIS ASS'Y (S-Z)	1	366	S5-OP9-006-940	SPR,PACK	2
307	S5-OA2-000-820	CLUTCH ASS'Y (S2)	1	367	S5-OP9-006-950	BRACKET,TOP	1
308	S5-OA2-000-800	ARM,IDLER ASS'Y (S)	1	368	----	SPR,CASS EARTH	1
309	S5-OP6-005-560	ARM,SS BRAKE (S)	1	369	S5-OP8-003-410	SPRING,P/R ARM	1
310	S5-OP2-002-920	REEL,T (S)	1	501	87-654-075-410	SCREW,TAP 2.6-10	1
311	S5-OA3-000-610	LOAD ARM S ASS'Y	1	502	S1-072-268-040	VT2+2.6-8	3
312	S5-OA3-000-620	LOAD ARM T ASS'Y	1	503	87-743-073-010	VT2+2.6-6	3
313	S5-OA4-002-090	G-ROLLER ASS'Y	2	504	87-743-073-410	SCREW,TAP 2.6-6	3
314	S5-OA4-001-880	BASE,INCL S ASS'Y	1	505	S1-0A1-268-040	SCREW,WASHER(A)M2.6-8	1
315	S5-OA4-001-960	BASE,INCL T(S) ASS'Y	1	506	S1-0B1-264-040	SCREW,WASHER(B)M2.6-4	1
316	S5-OA4-001-990	P5-3 ARM ASS'Y(S)	1	507	87-261-035-410	SCREW,PAN M2-6	3
317	S5-OA4-002-050	PINCH ROLLER BLOCK	1	508	87-261-032-410	SCREW,PAN M2-3	2
318	S5-OA4-001-750	TENSION ARM ASS'Y	1	509	87-258-091-010	U+M3-3	2
319	S5-OA4-001-840	TENSION BAND ASS'Y (S)	1	510	S1-0A1-235-040	SEMS A M2.3-5	2
320	S5-OA4-001-780	PINCH ROLLER LEVER ASS'Y	1	511	S2-P26-600-5N0	PW(CUT)2.6-6-0.5	3
321	S5-OA6-001-880	BRAKE T ASS'Y (S)	1	512	S2-Q26-47C-5N0	POLY,WASHER 2.6-4.7	2
322	S5-OA6-001-910	CAP BRAKE ASS'Y(S)	1	513	S2-P18-450-5N0	PW(CUT)1.8-4.5-0.5	1
323	S5-OA9-002-130	LINK ASS'Y	1	514	S3-ETW-300-000	E-RING 3	2
324	S5-OA9-002-160	LINK LEVER ASS'Y	1	515	S1-0A1-265-040	SCREW,WASHER(A) M2.6-5	3
325	S5-OP2-002-840	LEVER,CLUTCH (S)	1	CP101	----	CONN,PWB SIDE	1
326	S5-OP2-002-850	ACTUATOR,CLUTCH	1	H5001	S5-23D-910-340	HEAD,AC	1
327	S5-OP2-002-980	GEAR,COUPLING	1	H5002	S5-43D-020-130	HEAD,FE	1
328	S5-OP2-002-910	REEL,S (S)	1	M101	S5-96P-780-010	MOTOR(LOADING)	1
329	S5-OP6-005-410	WORM	1	M2001	S5-103-980-300	CAPSTAN DD UNIT F2QSB02	1
330	S5-OP6-005-630	BRACKET,MOTOR	1	M2003	S5-893-110-050	MICRO MOTOR F2OEL82	1
331	S5-OP3-001-780	GEAR,MAIN LOADING	1	PCB550	----	DECK PCB ASS'Y	1
332	S5-OP3-001-790	GEAR,LOADING S	1	Q101	S0-007-003-200	PHOTO,TR RPT-38PB113	1
333	S5-OP3-001-800	GEAR,LOADING T	1	UN4001	S4-C93-1B5-000	CYLINDER UNIT ASSY A4C931B50	1
334	S5-OP3-001-860	HOLDER,LOADING GEAR	1				
335	S5-OP4-004-720	ADJUST,TENSION	1				
336	S5-OP4-004-920	HOLDER,TENSION	1				
337	S5-OP4-004-900	LEVER,TENSION	1				
338	S5-OP4-004-750	COVER,P4	1				
339	S5-OP6-005-430	GEAR,JOINT	1				
340	S5-OP6-005-440	GEAR,MIDDLE	1				
341	S5-OP6-005-540	CAM,MAIN (S)	1				
342	S5-OP6-005-460	CAM,P5	1				
343	S5-OP6-005-650	CAM,PINCH ROLLER	1				
344	S5-OP6-005-610	ROD,MAIN(S)	1				
345	S5-OP7-000-350	REFLECTOR,LED	1				
346	S5-OP8-003-180	SPR,LOADING GEAR	2				
347	S5-OP8-003-340	SPR,P5 (S)	1				
348	S5-OP8-003-350	SPR,BRAKE T (S)	1				
349	S5-OP8-003-220	SPR,TENSION	1				
350	S5-OP8-003-360	SPR,CAP BRAKE (S)	1				
351	S5-OP8-003-420	SPRING,LOCKER (S)	1				
352	S5-OP8-003-260	SPR,LINK	1				
353	S5-OP8-003-280	SPR,DAMPER	1				
354	S5-OP8-003-300	SPR,RING	1				
355	S5-OP8-003-370	SPR,SS BRAKE (S)	1				
356	S5-OP9-006-800	OPENER,CASS	1				
357	S5-OP9-007-040	CASS,SIDE L(VA)	1				
358	S5-OP9-006-840	CASS SIDE R	1				
359	S5-OP9-007-090	TAPE GUIDE L (P,R)	1				

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
SYSCON PCB ASS'Y			*** CAPACITORS ***		
*** RESISTORS ***			C5517	87-010-545-040	CAP,E 0.22-50 V
▲ R508	S6-55U-433-1J0	RES,FUSE 330-1/4W	C5518	S2-35M-13R-3K0	CAP,TANTAL 3.3-10V
▲ R511	87-025-576-060	RES,M 68-1W	C5521	87-010-545-040	CAP,E 0.22-50 V
▲ R514	S3-X18-101-0J0	RES,M MOR1W010JB/B 1	C5523	87-016-334-080	CAP,E 4.7-25V
▲ R527	S0-X2X-212-4J0	RES,120K-1/2W	C5525	87-015-075-040	CAP,E 10-16V
▲ R529	S6-55U-433-1J0	RES,FUSE 330-1/4W	C5526	87-015-075-040	CAP,E 10-16V
*** CAPACITORS ***			C5527	S2-35M-010-0K0	CCA,TANTAL 10-6.3V
▲ C503	87-010-263-080	CAP,E 100-10V	C5529	87-015-075-040	CAP,E 10-16V
▲ C504	S2-122-B10-4M0	CAP,MP 0.1-250V	C5531	87-015-677-010	CAP,E 100-6.3V
▲ C505	SB-NLE-0ML-3M0	CAP,0.0033-250V AC	C5532	87-015-075-040	CAP,E 10-16V
▲ C506	S0-2LU-110-1M0	CAP,E 100-10V	C5533	87-015-695-080	CAP,E 1-50V
▲ C508	S0-2AF-C82-0M0	CAP,E 82-200V	C5534	S0-E7T-033-0M0	CAP,E 33-6.3V
C509	S0-JTS-L51-2J0	CAP,CER 100PF-500V	C5536	87-015-075-040	CAP,E 10-16V
C512	87-010-983-010	CAP,CER 0.01-500V	C5537	87-015-075-040	CAP,E 10-16V
▲ C514	87-010-236-080	CAP,E 1000-10V	C5538	87-015-075-040	CAP,E 10-16V
C517	87-015-695-080	CAP,E 1-50V	C5539	S0-E7T-033-0M0	CAP,E 33-6.3V
▲ C518	S0-2LU-810-0M0	CAP,E 10-100V	C5547	87-015-075-040	CAP,E 10-16V
▲ C519	87-010-387-010	CAP,E 470-25V	C5548	87-015-075-040	CAP,E 10-16V
▲ C520	S0-2LU-147-1M0	CAP,E 470-10V	C5552	87-016-053-080	CAP,E 22-16V
▲ C522	S0-2LU-322-1M0	CAP,E 220-25V	C5555	S0-2LU-247-0M0	CAP,E 47-16V
▲ C523	S0-2LU-810-0M0	CAP,E 10-100V	C6003	87-015-075-040	CAP,E 10-16V
▲ C524	SB-NLE-0ML-3M0	CAP,0.0033-250V AC	C6008	87-010-549-010	CAP,E 47-6.3V
C656	S0-2LU-010-1M0	CAP,E 100-6.3V	C6010	S0-2LU-022-1M0	CAP,E 220-6.3V
C657	S0-2LU-447-0M0	CAP,E 47-35V	*** DIODES ***		
C658	87-015-075-040	CAP,E 10-16V	▲ D502	S2-3T0-UG2-D00	DIODE,UG2D-G23
C1013	87-010-076-040	CAP,E 22UF-6.3V	▲ D503	87-A40-488-080	DIODE,1SS244T-77
C1016	87-010-549-010	CAP,E 47-6.3V	▲ D504	S2-LXE-658-000	DIODE,1N4005E-G23
C1021	S0-E7T-033-0M0	CAP,E 33-6.3V	▲ D505	S2-LXE-658-000	DIODE,1N4005E-G23
C1029	87-015-677-010	CAP,E 100-6.3V	D506	S1-7T0-024-400	DIODE,1SS244T-77
C1028	S5-JXT-P47-3Z0	CAP,E 0.047F-5.5V	▲ D507	87-020-465-010	DIODE,1SS133T
C1032	87-016-334-080	CAP,E 4.7-25V	▲ D508	S2-LXE-658-000	DIODE,1N4005E-G23
▲ C1033	S0-2LU-810-0M0	CAP,E 10-100V	D509	S6-E02-711-0A0	DIODE VARISTA ENE271D-10A
C1052	87-010-076-040	CAP,E 22UF-6.3V	D510	87-020-465-010	DIODE,1SS133T
C4001	87-010-549-010	CAP,E 47-6.3V	D511	87-A40-286-080	DIODE,RGP10JE-G3
C4004	87-010-549-010	CAP,E 47-6.3V	▲ D512	S2-8T1-DQ0-400	DIODE,21DQ04N-TA2B1
C4010	87-010-549-010	CAP,E 47-6.3V	D513	S9-7U0-130-1B0	ZENER,MTZJ13B
C4011	87-015-695-080	CAP,E 1-50V	▲ D514	S2-3T0-UG2-D00	DIODE SILICON UG2D-G23
C4016	87-016-334-080	CAP,E 4.7-25V	▲ D515	87-A40-488-080	DIODE,1SS244T-77
C4017	87-015-695-080	CAP,E 1-50V	D517	S9-7T0-270-1D0	ZENER,MTZJ27D
C4019	87-015-695-080	CAP,E 1-50V	D519	S2-8T1-DQ0-400	DIODE,21DQ04N-TA2B1
C4021	S0-E7T-033-0M0	CAP,E 33-6.3V	D520	87-002-743-080	ZENER,MTZJ33B T77
C4022	87-015-075-040	CAP,E 10-16V	▲ D523	S2-LXE-658-000	DIODE,1N4005E-G23
C4023	87-010-076-040	CAP,E 22UF-6.3V	D524	87-020-465-010	DIODE,1SS133T
C4024	87-016-334-080	CAP,E 4.7-25V	D526	SM-TZ5-6C0-000	ZENER,MTZ5.6CT-77
C4026	87-010-076-040	CAP,E 22UF-6.3V	▲ D527	87-020-465-010	DIODE,1SS133T
C4030	87-015-075-040	CAP,E 10-16V	▲ D528	S2-LXE-658-000	DIODE,1N4005E-G23
C4031	87-015-695-080	CAP,E 1-50V	D651	87-070-136-010	ZENER,MTZJ5.1C T
C4033	87-015-695-080	CAP,E 1-50V	D652	S3-Z68-V10-000	ZENER,MTZJ6.8B
C4034	87-015-695-080	CAP,E 1-50V	D1001	S0-106-000-600	LED,SID1050CM
C4035	87-015-677-010	CAP,E 100-6.3V	D1002	S2-LXE-658-000	DIODE,1N4005E-G23
C4037	87-015-695-080	CAP,E 1-50V	D1003	S9-3T1-120-1A0	ZENER,TMPG06-12A-G3
C4039	87-015-695-080	CAP,E 1-50V	D1004	S2-LXE-658-000	DIODE,1N4005E-G23
C4043	87-015-695-080	CAP,E 1-50V	D1005	S2-LXE-658-000	DIODE,1N4005E-G23
C4045	87-010-549-010	CAP,E 47-6.3V	D1006	S2-LXE-658-000	DIODE,1N4005E-G23
C4057	87-010-076-040	CAP,E 22UF-6.3V	D1007	87-020-465-010	DIODE,1SS133T
C4058	87-010-076-040	CAP,E 22UF-6.3V	D1009	87-020-465-010	DIODE,1SS133T
C4059	87-016-334-080	CAP,E 4.7-25V	D4001	87-020-465-010	DIODE,1SS133T
C4060	87-015-695-080	CAP,E 1-50V	D5501	87-020-465-010	DIODE,1SS133T
C4061	87-015-695-080	CAP,E 1-50V	*** ICS ***		
C4062	87-015-695-080	CAP,E 1-50V	▲ IC501	S1-KJ9-A43-100	IC,KIA431
C4070	87-010-549-010	CAP,E 47-6.3V	IC651	S0-7F5-297-700	IC,BU2977FS
C4071	87-015-677-010	CAP,E 100-6.3V	IC1001	S5-4F5-009-0A0	IC,OEC0090A
C4201	S0-2LU-047-1M0	CAP,E 470-6.3V	▲ IC1002	S0-7SQ-955-AN0	IC,BA6955AN
C4209	87-015-075-040	CAP,E 10-16V	IC1003	SE-1J0-S31-AH0	IC,RE5VS31A
C5501	87-015-075-040	CAP,E 10-16V	IC1099	S4-C9A-2B0-150	IC,S-24C08ADPA-01
C5502	87-015-075-040	CAP,E 10-16V	IC4001	S0-3F3-106-7M0	IC,LA71067M-MPB
C5505	87-015-695-080	CAP,E 1-50V	IC5501	S0-1F6-2FB-P00	IC,AN3662FBP
C5509	87-010-402-080	CAP,E 2.2-50V	*** TRANSISTORS ***		
C5510	87-015-075-040	CAP,E 10-16V	▲ Q502	SD-3T0-073-400	TR,2SD734(E,F,G)-AA
C5511	87-010-076-040	CAP,E 22UF-6.3V	▲ Q503	SC-300-416-000	TR,2SC4160-OEC
C5512	87-015-075-040	CAP,E 10-16V			
C5513	87-015-695-080	CAP,E 1-50V			
C5516	87-016-053-080	CAP,E 22-16V			

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
*** TRANSISTORS ***			*** CONNECTORS ***		
▲ Q509	SD-3T0-124-600	TR,2SD1246(S,T)-AA	CP4001	S6-972-906-200	CONN PWB SIDE
▲ Q510	S0-025-004-800	PHOTO,COUPLER TLP621	CP4002	S6-9J7-600-190	CONN,IMSA-9604S-06Z13
▲ Q511	S0-025-004-800	PHOTO,COUPLER TLP621	CP4003	S6-971-203-200	CONN
▲ Q512	SD-3T0-073-400	TR,2SD734(E,F,G)-AA	*** CRYSTAL & CERAMIC OSCILLATORS ***		
Q513	87-026-236-080	TR,DTC124EK	X1001	S0-OCT-010-020	X'TAL,HC-49/U
▲ Q518	89-324-122-080	TR,2SC2412KT		S0-OCF-3R5-120	X'TAL HC-49/U
Q651	87-026-227-080	TR,DTA114E	*** TUNER ***		
Q1001	S0-02M-005-700	PHOTO COUPLER SG-260	▲ TU6001	S1-626-000-180	RF UNIT TMDH2-A05A
Q1002	S0-02M-005-700	PHOTO COUPLER SG-260			
Q1003	89-324-122-080	TR,2SC2412KT	*** FUSES ***		
Q1004	S0-027-005-300	PHOTO COUPLER RPI-352Q01	▲ F501	S8-0PA-1R6-010	FUSE,23301.6
Q1005	S0-027-005-300	PHOTO COUPLER RPI-352Q01		S6-710-T00-060	HOLDER,FUSE EYF-52B
Q1006	S0-001-003-800	PHOTO TR,PNA2604M010R	FH501	S6-710-T00-060	HOLDER,FUSE EYF-52B
Q1007	87-026-236-080	TR,DTC124EK	FH502		
Q4001	SC-3T0-333-100	TR,2SC3331(S,T,U)-A	*** OTHERS ***		
Q4002	SC-3T0-333-100	TR,2SC3331(S,T,U)-A	OS651	S7-7Q0-000-180	REMOTE RECEIVER PIC26043LO
Q4003	87-026-228-080	TR,DTA124EK			
Q4004	89-318-154-080	TR,2SC1815Y	V651	S9-6F7-9R0-040	CRT,SVV-07SS22
Q4005	89-113-187-080	TR,2SA1318(S,T)			
Q4006	SD-3T0-073-400	TR,2SD734(E,F,G)-AA	OPERATION 1 PCB ASS'Y		
Q4007	89-318-154-080	TR,2SC1815Y	*** SWITCHES ***		
Q4008	89-324-122-080	TR,2SC2412KT	SW601	S5-042-01T-320	SW,TACT
Q4009	89-110-154-080	TR,2SA1015Y(TPE2)		S5-042-01T-320	SW,TACT
Q4201	89-110-154-080	TR,2SA1015Y(TPE2)	SW602	S5-042-01T-320	SW,TACT
Q4202	87-026-228-080	TR,DTA124EK	SW603	S5-042-01T-320	SW,TACT
Q4203	89-318-154-080	TR,2SC1815Y	SW604	S5-042-01T-320	SW,TACT
Q4204	89-318-154-080	TR,2SC1815Y	SW605	S5-042-01T-320	SW,TACT
Q4205	87-026-236-080	TR,DTC124EK	SW606	S5-042-01T-320	SW,TACT
Q6001	87-026-236-080	TR,DTC124EK	SW607	S5-042-01T-320	SW,TACT
			SW608	S5-042-01T-320	SW,TACT
*** COILS ***			*** CONNECTORS ***		
B501	S2-4AT-034-810	CORE,BEADS BL02RN1-R62T2	CP602	S6-9J7-400-190	CONN,IMSA-9604S-04Z13
B502	S2-4AT-036-550	CORE,BEADS BL01RN1-A63T6			
▲ L501	S2-9T0-000-830	COIL,LINE FILTER 0R3A433F20	OPERATION 2 PCB ASS'Y		
L504	87-003-147-010	COIL,22UH	*** DIODE ***		
L505	87-003-147-010	COIL,22UH	D602	S0-213-5Q1-600	LED,SLZ-345B-02
L1003	87-003-282-010	COIL,12UH			
L4001	S2-167-F22-0J0	COIL,22UH EL0305RA-220J	*** JACK ***		
L4002	S2-167-F47-0J0	COIL,47UH EL0305RA-470J	J601	S6-0X4-310-100	JACK,RCA
L4003	87-005-096-010	COIL,100UH			
L4005	S2-167-F22-0J0	COIL,22UH EL0305RA-220J	*** SWITCHES ***		
L4007	87-003-152-010	COIL,100UH	SW609	S5-042-01T-320	SW,TACT
L4008	S2-167-F47-0J0	COIL,47UH EL0305RA-470J		S5-042-01T-320	SW,TACT
L5501	S2-167-F10-1J0	COIL,100UH EL0305RA-101J	*** CONNECTORS ***		
L5502	87-003-152-010	COIL,100UH	CP607	S6-9J7-800-190	CONN,IMSA-9604S-08Z13
L5504	S2-167-F22-0J0	COIL,22UH EL0305RA-220J			
L6001	S2-167-F10-1J0	COIL,100UH EL0305RA-101J	AND OTHERS		
L6002	S2-167-F22-0J0	COIL,22UH EL0305RA-220J	*** CONNECTORS ***		
L6003	87-003-146-010	COIL,15UH	CD601	S2-2F0-810-030	CORD,JUMPER 2F081003
T4001	S3-162-600-7S0	COIL,BIAS OSC		S2-2F0-407-020	CORD,2F040702
*** TRANSFORMERS ***			CD1001	S2-2F0-407-020	CORD,2F040702
▲ T501	S4-812-200-440	TRANS,SWITCHING 8122004	CD1002	S2-2F0-615-010	CORD,JUMPER 2F061501
*** JACKS ***			CD4001	S2-2F0-717-010	CORD,JUMPER 2F071701
J4201	S6-024-110-060	JACK RCA	*** AC CORD ***		
*** SWITCHES ***			▲ CD501	S2-0R6-149-020	CORD AC BUSH
SW1001	S5-082-210-010	SW,LEAF			
SW6001	S5-012-010-100	SW,SLIDE SSAB110	*** CONNECTORS ***		
*** CONNECTORS ***			CD602	S2-2F0-407-020	CORD,JUMPER 2F081003
▲ CP501	S6-973-200-390	CORD UX CONNECTOR		S2-2F0-407-020	CORD,2F040702
CP651	S6-9J7-400-290	CONN,PCB SIDE IMSA-9604S-04Z14	CD1001	S2-2F0-407-020	CORD,2F040702
CP652	S6-9J7-800-290	CONN,IMSA-9604S-08Z14	CD1002	S2-2F0-615-010	CORD,JUMPER 2F061501
CP1001	S6-9J7-700-290	CONN,IMSA-9604S-07Z14	CD4001	S2-2F0-717-010	CORD,JUMPER 2F071701
CP1002	S6-972-805-900	CONN PWB SIDE	*** AC CORD ***		
CP1003	S6-9J7-400-290	CONN,PCB SIDE IMSA-9604S-04Z14	▲ CD501	S2-0R6-149-020	CORD AC BUSH



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